MICHIGAN STATE UNIVERSITY

ALLIANCE for AFRICAN PARTNERSHIP

Strengthening Agricultural Extension Training

Process Skills and Competency Gaps in Undergraduate Agricultural Extension Curriculum in South Africa

By

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University of Pretoria

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YUNIVESITHI YA FREISTATA

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April 2023

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April 2023

Alliance for African Partnership (AAP) is a consortium of institutions supporting work that transforms lives and addresses global challenges through sustainable, effective, and equitable long-term collaborations among African institutions, Michigan State University, and other international partners.

Required Citation: Von Maltitz, L., Davis, K., Suvedi, M., Chanza, C., Agwu, A.E., Sasidhar, P.V.K., Dimelu, M.U., Liverpool-Tasie, L.S.O., Anugwa, I.Q., and Tchuwa, F. (2023). Strengthening Agricultural Extension Training: Process Skills and Competency Gaps in Undergraduate Agricultural Extension Curriculum in South Africa. Partnerships for Innovative Research in Africa (PIRA) Research Report. East Lansing, Michigan, USA: Alliance for African Partnership, Michigan State University.

Disclaimer: Research for this report was funded by Michigan State University through the Alliance for African Partnership (AAP) for a 2021 Partnerships for Innovative Research in Africa (PIRA) grant award at the scaling grant funding level titled ***'Strengthening Agricultural Extension Training in the MSU Alliance for African Partnership (AAP) Consortium Partners in Africa'***. The views expressed in this report are those of the author(s) and do not necessarily reflect the views or policies of the organizations they represent.

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ABBREVIATIONS AND ACRONYMS

AES	Agricultural Extension and Advisory Services
ASSAf	Academy of Science of South Africa
BFAP	Bureau for Food and Agriculture Policy
DAFF	Department of Agriculture, Forestry and Fisheries
DALRRD	Department of Agriculture, Land Reform and Rural Development
ERP	Extension Recovery Plan
FGDs	Focus Group Discussions
GFRAS	Global Forum for Rural Advisory Services
ICT	Information and Communication Technology
I3A	International Agriculture Academy for Africa
NELK	New Extensionist Learning Kit
NGO	Non-governmental Organization
NQF	National Qualifications Framework
PCD	Participatory Curriculum Development
SAICA	South African Institution for Chartered Accountants
STATSSA	Department of Statistics South Africa
SACNASP	South African Council for Natural Scientific Professions
SAQA	The South African Qualifications Authority
SASAE	South African Society of Agricultural Extension
UG	Undergraduate

ACKNOWLEDGMENTS

Research for this report was funded by Michigan State University through the Alliance for African Partnership (AAP) for the 2021 Partnerships for Innovative Research in Africa (PIRA) grant award at the scaling grant funding level titled ***'Strengthening Agricultural Extension Training in the MSU Alliance for African Partnership (AAP) Consortium Partners in Africa'***. We are extremely grateful to Dr. Richard Mkandawire, director, Africa Office, AAP; and Dr. José Jackson-Malete and Dr. Amy Jamison, co-directors, AAP, for the award and administrative help. We would like to acknowledge the support from Derek Tobias for facilitating the grant management and reporting.

In **USA**, authors gratefully acknowledge the support received from Dr. Rebecca Jordan, department chair, and Ms. Ashley Lathrop, research administrator in the Department of Community Sustainability at Michigan State University for their support in grant management. Mr. Gang Lu, doctoral candidate in the MSU Department of Forestry, assisted in quantitative data analysis. Ms. Leslie Johnson provided editorial support for all reports in a timely manner. We gratefully acknowledge their help and support.

In **South Africa**, we thank the interviewees and others who contributed their valuable insights and time. Finally, we would like to remember Dr. Stefanus (Fanie) Terblanché, a South African extension professional who was a dedicated champion to extension in South Africa until his passing in 2022.

The authors alone accept responsibility for any shortcoming or factual errors in this report.

– Authors

EXECUTIVE SUMMARY

Assessment of process skills and competency gaps in undergraduate (UG) agricultural extension curriculum can assist in developing competency-based curricula which in turn could enhance the efficiency of agricultural extension and advisory services (AEAS) in South Africa. The Michigan State University Alliance for African Partnership (AAP) launched a multi-country study to contribute to upgrading and tailoring the agricultural extension curricula at participating institutions. The research aims to identify skills and competency gaps in undergraduate agricultural extension curricula in the participating countries – Kenya, Malawi, Nigeria, South Africa and Uganda - and use the results to contribute to formulating appropriate curricula. The research questions are:

1. Do extension programs effectively address the needs of current food and agricultural systems?
2. What are the critical job skills and core competencies required of extension workers to effectively plan, implement, and evaluate extension work in today's changing context?
3. Does the undergraduate curriculum in extension education include education and/or training on these job skills or core competencies?
4. What are the barriers to effectively training extension workers with required core competencies, and how can these barriers be removed?

The study undertaken in the above participating countries assessed 11 process skills and competencies: program planning, program implementation, communication and public relations, information and communication technologies (ICTs), program evaluation, personal and professional development, diversity and gender, technical subject matter expertise, marketing, brokering and value chain development, soft skills and nutrition skills and competencies. These were assessed qualitatively using focus group discussions (FGDs) and quantitatively using an online questionnaire with two Likert scale based questions: "How important is this skill or competency for an extension worker?" and "How well does the undergraduate extension curriculum cover this competency?".

Key Findings from the Quantitative Data (Online Survey):

- The majority of the respondents were in the age group of 41-50 years of age, 48.1% of the respondents who answered the question were male, 50% were female and 1 respondent chose not to reveal their gender. The majority (55.8%) had a bachelor's degree qualification, 28.9% had master's degrees, and 15.4% had Ph.D. degrees.
- The respondents considered all the eleven process skills and competencies as important for an extension worker. Based on their familiarity with the UG extension curriculum,

they also regarded all but one skill as moderately well covered in the curriculum. Communication skills and competencies was considered very well covered in the UG extension curriculum.

- The mean scores on the level of importance of all process skills and core competencies of agricultural extension professionals in South Africa were significantly higher than their corresponding mean scores on level of coverage in the UG courses.
- The respondents considered internship at various work environments and providing opportunities to attend trainings, seminars, workshops, webinars, among others, as very appropriate ways to acquire the competencies. They also considered in-service training, preservice training by revising or updating the curriculum, basic induction training, and internship at various work environments as important.
- The major barriers to effective implementation of the UG extension curricula as indicated by the respondents are budget to support practical learning experience, student motivation to study extension and engage in practical extension work, classroom and demonstration farms or facilities, development of an effective extension curriculum and quality faculty to teach extension courses, time constraints and teacher motivation to teach required process skills and competencies, and quality textbooks and/or manuals. Other barriers are practical knowledge of trainers, political appointments and barriers/ inappropriate professional classifications for development extension and the lack of stable, technically competent public extension services and access to farms for experience training, among others.

Key Findings from the Qualitative Data (FGDs):

Skills that were singled out by participant as essential included:

A. Technical skills:

- In-depth, practical production knowledge extended with specialization in particular skills related to the region employed in. For example, specializing in irrigation in an area where irrigation is applied.
- Knowledge of genetically modified crops and various certification schemes.
- Agro-processing skills.
- The ability to do research on an applicable problem and share information with clients.
- Resource management skills.
- Farm engineering knowledge.
- Knowledge of sustainable farming systems.

B. Facilitation and communication skills

- The ability to communicate with and facilitate effectively among all stakeholders (farmers, private and public sectors) is vital.
- The competency to transfer knowledge between various role players as well as understanding of other cultures and ethnic differences.
- The knowledge and ability to use ICTs was mentioned as becoming increasingly important, especially given the challenges of the COVID-19 pandemic and with rural locations being distant and sometimes inaccessible.

C. Soft skills

- Attitudes such as accountability, enjoyment of people, empathy, and positivity were emphasized.
- Professional ethics, critical thinking, and problem solving were seen as very important.

D. Business management and marketing skills

- Knowledge of value adding and value chain management.
- Financial management skills.
- The ability to build farmers' capacity to manage their farming enterprises effectively and not be dependent on extension services forever.
- The general consensus among the focus groups was that the current extension curricula in South Africa do not produce competent AEAS professionals. However, it was highlighted that the curriculum should not be blamed for everything. In many instances, the curriculum is sufficient, but it needs to be followed up by practical training relevant to the contexts that students will work in. It is also unfair to expect a fresh graduate to immediately dispense expert advice.
- Increasing the practical exposure of students through fieldwork was reiterated by all of the participants. It was mentioned that not only should students be exposed to farmers, but they should also be exposed to all the various role players in the agricultural system, including researchers, financial institutions, input suppliers, marketers, etc.
- The lack of regular interaction between research and extension in practice leads to the lack of transfer of knowledge between researchers and farmers. Respondents suggested that this could be improved by regularly facilitating cooperation between these role players. Enhanced communication between the training institutions and the employers of extension staff would also result in greater efficiency.

Key Recommendations for Policy Decisions:

- Keep curricula relevant and updated: Regular review of a curriculum by all the stakeholders of the profession is needed to ensure appropriate training of AEAS professionals to equip them for the workplace. Practical training remains an important component of agricultural education. Education institutions must ensure that they have the facilities to provide students with sufficient exposure to real-life scenarios. If funding is a problem, these institutions must consider forming alliances with private-sector role players (agricultural service providers, farmers) who can assist by providing access to their facilities.
- Key role players in the industry (South African Society of Agricultural Extension, government, training institutions and farmers) should convene to contribute to formulating the ideal undergraduate curricula and providing continual feedback on the efficiency thereof.
- Consistency of curricula among different training institutions is crucial.

CHAPTER 1 : INTRODUCTION

1.1 Agriculture in South Africa

Endowed with rich natural resources and a suitable climate for diverse agriculture, South Africa produces various agricultural products in the nine provinces. The agricultural sector in South Africa is of significant importance to the country's general economy and the food security of its citizens. Although its contribution to GDP is small, the sector's impact lies in the linkage to and influence on related sectors such as manufacturing and transport (Department of Agriculture, Land Reform and Rural Development (DALRRD, 2021). With population statistics indicating an increase from 45 million in 2002 to 59 million in 2020, the importance of a well-functioning agricultural sector is pivotal to food security in the country.

The main contributors to the produce pool in the country in terms of sales are listed in order of importance below (Statistics South Africa (StatsSA), 2022; Fruit South Africa, 2020; Bureau for Food and Agriculture Policy (BFAP), 2021):

1. Animal and animal products: cattle and chickens are the main contributors to the livestock sector. Chicken meat, fresh milk, and eggs contribute the most to the animal production sector.
2. Horticultural crops and products: fruit (excluding grapes) are a significant contributor, followed by vegetables. In South Africa, a wide variety of fruit is produced for the local and export markets. The main contributors are oranges, apples, lemons and limes, pears, soft citrus, grapefruit, and grapes. The significant vegetable sector contributors are potatoes, green maize, sweetcorn, and then tomatoes.
3. Field crops: maize is the most significant contributor in this sector, followed by wheat, sugarcane, and other field crops including cotton, sunflowers, sorghum, soybeans, barley, and canola.

In a country with an official unemployment rate of 35.3% (StatsSA, 2022) and an unofficial unemployment rate of 46.2% (Business Tech SA, 2022), food security is under threat. Many households turn to agriculture to supplement their diets. The percentages of households per province in South Africa that were involved in agricultural activities in 2020 are displayed in Figure 1.1.

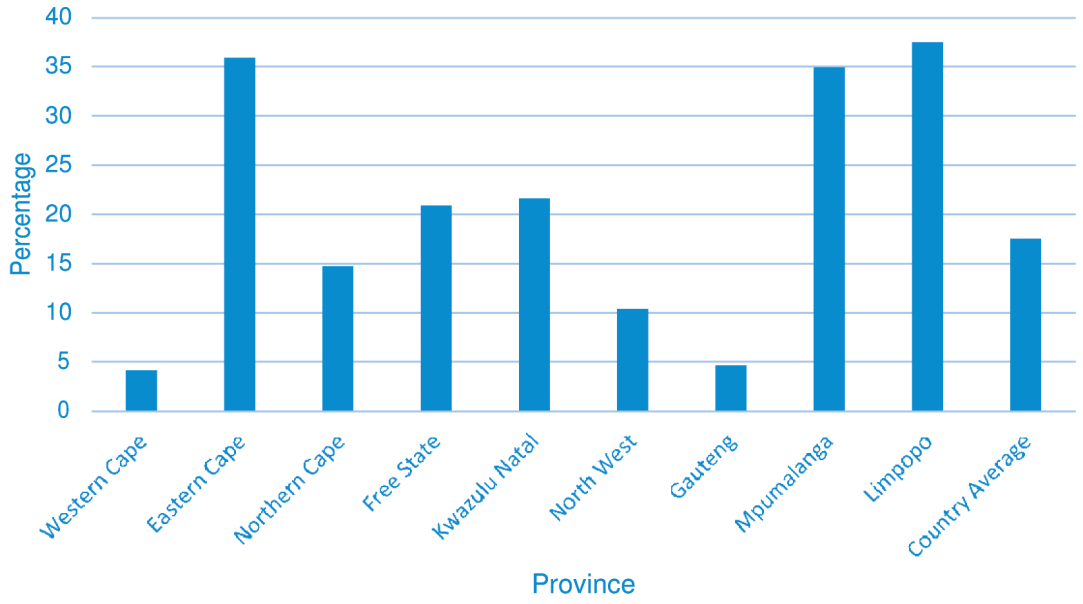

Figure 1.1 : Percentage of households involved in agricultural activities by province in South Africa

(Source: StatsSA, 2020)

The agricultural sector in South Africa is facing many challenges. The effects of climate change have become noticeable. Rising input costs, especially the recent drastic fuel price increase, threaten production's profitability and sustainability. The COVID-19 pandemic has caused havoc in the sector by reducing food sales, reducing or stopping activities of agro-processing plants and harbors due to lockdowns, and constricting general production due to restricted availability of critical mechanical parts and inputs (Meyer et al., 2022).

In light of these circumstances, the importance of a knowledgeable, efficient agricultural extension service in South Africa cannot be overemphasized. Extension and advisory workers are directly linked to agricultural producers in rural areas. They are a critical link between the producers, government, the research community, and credit and input supply organizations (Roberts, 2022). Extension services are tasked with assisting communities in adapting to change, be it to new circumstances or through new technology (Davis et al., 2021). Supporting farmers to enhance production while preserving natural resources amid climate change is part of their role (Davis et al., 2020). When operating efficiently, extension services play a vital role in poverty alleviation and rural development (Maulu et al., 2021; Hlatshwayo and Worth, 2019).

The following section examines the development of agricultural extension and advisory services in South Africa from its inception to current times.

1.2 The History of Agricultural Extension in South Africa

The South African agricultural extension service, comprising six extensionists, was initiated in 1925 by the minister of agriculture. Following the Anglo-Boer War (1899-1902) and First

World War (1914-1918), farmers needed assistance in acquiring knowledge and enhancing their production to ensure food security at the time (Koch and Terblanché, 2013). The role of extension services was expanded in 1933 from merely advisory to facilitating government assistance schemes (Liebenberg, 2015). The first higher institution to offer training to potential agricultural extensionists in the country was the University of Pretoria, which did so during the early 1940s. Other institutions followed, and agricultural colleges emerged across the country (Khwidzhili and Worth, 2019). With several professionals operating in the field, the South African Society of Agricultural Extension (SASAE) was formed in 1966 to support the profession.

Before 1994, legislated segregationist policies by race existed in South Africa, and extension services were also racially segregated. Extension services catered separately to the needs of the people of color and the white people of South Africa (Koch and Terblanché, 2013). Extension services provided to black farmers focused on livestock as it was said that cattle, in particular, fulfills a fundamental role in the lives of black farmers.

After 1994, South Africa achieved democracy, and segregated extension services were amalgamated into a single service. Extension services' focus changed primarily to smallholder and/or previously disadvantaged farmers. Nine provincial extension services were set up to replace the previous compartmentalized extension services. There was also a reorganization of government extension and increased hiring of government extensionists. In addition, there was enhanced participation of private and semi-private actors in extension. Women started playing more prominent roles in extension service delivery. Commercial agriculture became more reliant on the private sector for extension services.

With the change in government came policy changes affecting the public sector, including agricultural extension and advisory services.

A brief history of the public policy documents published since 1994 to date is provided below:

– **2005:** The first Norms and Standards for Extension and Advisory Services in Agriculture was published in 2005 by the then Department of Agriculture. This document highlighted that extension and advisory services should focus on:

o Facilitating improved farmer access to support services (which include information, finance, inputs, technical expertise, regulatory services, and access to markets).

o Providing farmers with skills and knowledge for ensuring sustainable resource management.

o Facilitating access to and awareness of new technologies.

o Facilitating communication between farmers, farmer organizations, mentors, and advisors (Department of Agriculture, 2005)

According to the document, to ensure efficiency, extension and advisory staff must be efficient communicators, be able to manage projects independently, be able to manage the required information and knowledge, and be customer focused. They

should be skilled in problem solving and analysis, people management, and service delivery innovation. They should also promote confidence in the department through honesty and integrity.

- **2007:** A report was published profiling the government-employed extension and advisory service officers of the time (Department of Agriculture, Forestry and Fisheries (DAFF), 2007). In this document, public extension staff were profiled according to province, age, race, gender, qualifications, and experience. Extension to farmer ratios were also profiled, and finally, a comparative analysis was done comparing the extension personnel profile to the set norms and standards of 2005.
- **In 2008**, an Extension *Indaba* (a discussion or conference) was held to discuss the challenges faced by public sector extension and advisory services in the country. An Extension Recovery Plan (ERP) was consequently formulated (DAFF, 2008). In this document, the strategic objectives of the ERP were listed as follows:
    - Ensure visibility and accountability of extension.
    - Promote professionalism and improve the image of extension.
    - Recruit extension personnel.
    - Reskill and reorientate extension workers.
    - Provide ICT infrastructure and other resources.
- The decision was made to develop a National Policy on Extension and Advisory Services to improve effectiveness and efficiency (DAFF, 2016), which followed in 2016.

  The significant challenges experienced in the sector were highlighted in this policy document as follows:
    - The poor linkage between research, extension, and producers.
    - Low extension to producer ratio.
    - Disintegrated efforts from various extension support agencies.
    - Lack of national policy and regulatory framework.
    - Limitations in the extension education system and narrow service focus.
- **2020:** The most recent document released was the Draft Review of the National Framework for the Minimum Norms and Standards for Extension and Advisory Services in Agriculture, which should replace the first version of 2005 with an updated, relevant version (Draft 2, Version 2) (DALRRD, 2020). The guiding principles for extension and advisory services listed in the document are:
    - Poverty eradication.
    - Equity.

- Prioritizing production and income opportunities.
- Promoting sustainability.
- Pluralistic and integrated extension and advisory services.
- Trustworthiness, integrity, and efficiency.
- A strong link between research, extension, and producers.
- Demand-driven.
- Relevant.
- Human and social capital development.
- Participatory.
- Cooperative governance.
- Accountability.
- High-quality advisory service.
- *Batho-Pele* (people first).

The problem of limited efficiency in the public agricultural extension and advisory sector is mentioned, which will be discussed in the section on challenges in agricultural extension.

1.3 Organogram of Agricultural Extension in South Africa

DALRRD is responsible for public- sector agricultural extension in South Africa. However, the country has a three-tiered system of government, in which national, provincial, and local levels of government have legislative and executive authority. At the national level, DALRRD's vision is: *A united and transformed agricultural, forestry, and fisheries sector that ensures food security for all and economic prosperity. Its mission is: Advancing food security, job creation, economic growth, and transformation of the sector through innovative, inclusive, and sustainable policies, legislation, and programs*.

DARRLD has four strategic outcome-oriented goals:

- Effective and efficient strategic leadership, governance, and administration.
- Enhance production, employment, and economic growth in the sector.
- Enabling environment for food security and sector transformation.
- Sustainable use of natural resources in the sector.

i. Public extension services

Extension and advisory services fall under the Chief Directorate of National Extension Support Services (Figure 1.2).

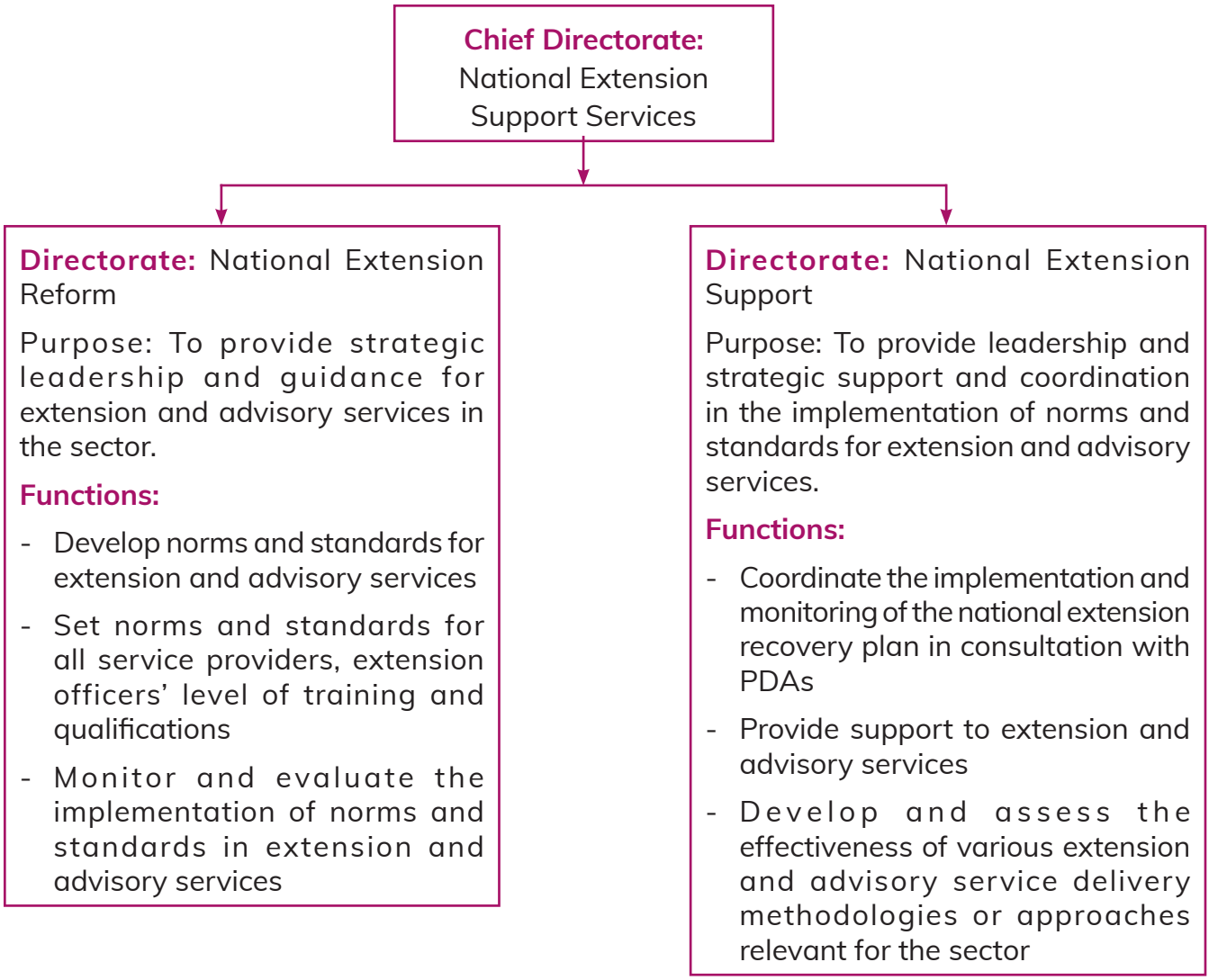

Figure 1.2 : Organogram of agricultural extension and advisory services in South Africa

Source: Authors' compilation of information available from the Department of Agriculture, Land Reform and Rural Development website (https://www.dalrrd.gov.za/About-Us/Structure- and-Functions)

According to the National Policy on Extension and Advisory Services (DAFF, 2016), the coordinating responsibilities of the sector are structured according to national, provincial, and district levels. Each level has representatives from DALLRD, the private sector, research and academics, and producer organizations.

There are currently 2,704 public officers (practitioners and managers) (Table 1) and roughly 1,500 private/nongovernmental officers distributed throughout the nine South African provinces. Figure 1.3 indicates the number of public extension practitioners (excluding managers) available to interact directly with farmers in each province of the country, totaling 2492 according to the last departmental survey in 2021.

Table 1.1 : Distribution of public extension officers in South Africa and ratio to farmers

Province	Number of Extension officials		Total # extension workers	Estimated # farmers [GHS 2019, StatsSA] {Thousands}	Extension to farmer ratio (current)
	Managers	Extension practitioners			
EC	42	488	530	518	1 061
FS	11	116	127	145	1 250
GP	5	133	138	219	1 647
KZN	33	752	785	544	723
LP	49	445	494	619	1 391
MP	25	172	197	374	2 174
NC	9	49	58	38	776
NW	30	275	305	114	415
WC	8	62	70	53	855
TOTAL	**212**	**2 492**	**2 704**	**2 624**	**1 053**

Source: DALRRD, 2021

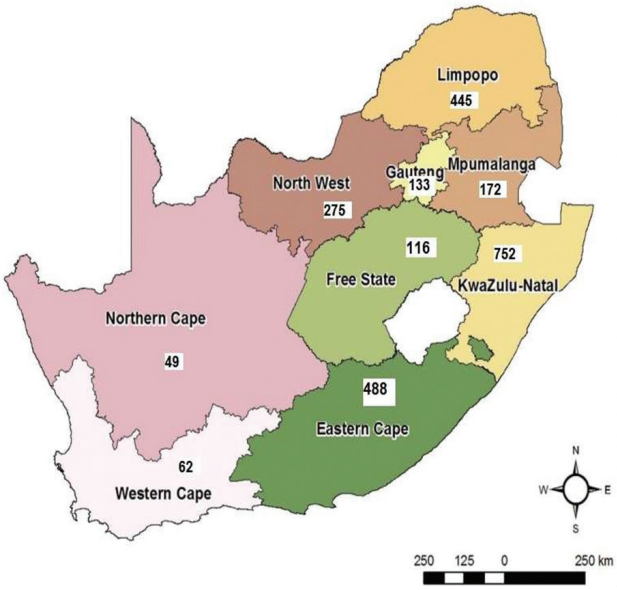

Figure 1.3 : Distribution of public extension officers (excluding managers) by province

Source: DALRRD, 2021

ii. Private extension services

The following institutions typically provide private extension services in South Africa:

- Agricultural cooperatives offer training and demonstration days.
- Seed companies provide demonstration days and do farm visits for personalized advice.

- Livestock stud associations provide training and information days/courses to educate on livestock health, feeding, and management.
- Feed companies provide expert advice on the feeding requirements of livestock.
- Pesticide companies provide advice on pest and disease control of horticultural and field crops.

1.4 Challenges in Agricultural Extension in South Africa

According to the latest government review, the challenges in the public agricultural advisory and extension service in South Africa include the following (DALRRD, 2020):

- The general public criticizes extension and advisory services for being ineffective and invisible. The department, however, attributes this to internal departmental limitations in available resources and capacity. They further argue that extension staff have no control over several factors such as the value chain, government structures and policies, climate change, and deteriorating natural resources.
- Training for extension practitioners is inadequate.
- Funding to capacitate the sector is limited.
- Some staff members follow a tunnel vision approach, focusing only on the here and now instead of a forward-looking approach.
- Extension staff members lack professional expertise and adequate opportunities to gain practical experience.

Extension practitioners contend that limited funding hinders their efficiency and ability to render efficient services. Available technologies are often unsuitable for rural farmers, and lack of experience and training among extension practitioners is also mentioned (Duvel, 2004; Oladele, 2015). Davis et al. (2019) also found in their study among members of SASAE that extension professionals have tended to blame farmers for being the authors of their own problems. Extension staff are well aware of the accusations of inefficiency, which leads to a lack of motivation and self-efficacy, and consequential low performance (Agholor, 2019).

Farmer opinions on the efficiency of agricultural advisory services are divided - some receive adequate support in their view, while others have never received assistance from extension staff. Studies in the Eastern Cape province, Gauteng province, and Western Cape province have found that farmers considered the public extension services ineffective (Khapayi and Celliers, 2016; Maake and Antwi, 2022). Reasons included inadequate competencies of extension staff, absent extension staff, and divided views between farmers and extensionists about the goals and outcome of efficient extension (Afful, 2016; Sebopetsa, 2018; von Maltitz et al., 2021; Maake and Antwi, 2022). A study conducted by Cloete et al. (2019) in the Free State province of South Africa found that there was a notable difference between farmers and extension officers in terms of perceptions of what agricultural extension entails or should entail, and the elements of effective extension methods. Many of the farmers felt that extension should mainly focus on supplying inputs and not to assist with technical information and training (Cloete et al., 2019).

Equipping agricultural extensionists with the relevant skills and competencies through appropriate higher education is undeniably a crucial component of their efficiency. This document reports on a study conducted to determine the process skills and competency gaps in agricultural extension curricula in South Africa.

1.5 Study Background

In a report released by the Academy of Science of South Africa (ASSAf) in 2017 on agricultural education and training status in the country, the curricula were criticized for being irrelevant and excessively focused on production. Most curricula lacked practical training and training to bridge the skills-knowledge-practice gap (ASSAf, 2017). Curricula are not sufficiently focused on equipping the graduate to function in the workplace or adhere to the demands of the career; in other words, the skill set needed by extension staff to be efficient is not taught by the majority of available curricula in the country (Gadzirayi et al., 2020; Polepole, 2018).

Given that the situation is not unique to South Africa, the Michigan State University Alliance for African Partnership (AAP) launched a multi-country study to contribute to upgrading and tailoring the agricultural extension curricula at participating institutions. The research aims to identify skills and competency gaps in undergraduate agricultural extension curricula in the participating countries – Kenya, Malawi, Nigeria, South Africa and Uganda - and use the results to contribute to formulating appropriate curricula.

1.6 Significance of the Study and Research Questions

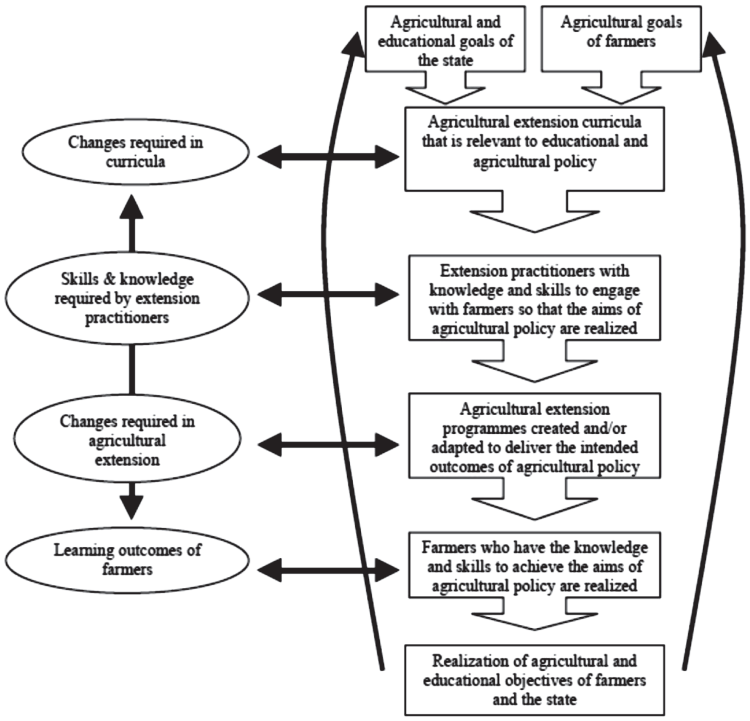

Figure 1.4 : The relevance of quality agricultural extension curricula in the process of efficient extension

Source: Worth (2008) *with permission*

The importance of appropriate, relevant agricultural extension curricula in providing efficient extension and advisory services is clearly illustrated in Figure 1.4. Collaboration between the government, farmers, and educational institutions is critical to ensuring the development of quality agricultural extension curricula.

The research questions are:

- What are the critical job skills and core competencies required of extension workers to effectively plan, implement, and evaluate extension work in today's changing context?
- Does the undergraduate extension curriculum include education and/or training on these job skills or core competencies? What are the gaps?
- What are the barriers to effective training of extension workers with required core competencies, and how can these barriers be overcome?

1.7 Objectives of the Study

The study aims to assess the current agricultural extension curricula available at tertiary institutions in South Africa. The specific objectives include:

- Review agricultural extension curricula currently in use in South African tertiary institutions at the undergraduate level.
- Identify critical process skills and competencies of extension professionals, process skills gaps, and areas of potential curricular reform.
- Recommend improvements in agricultural extension curricula to prepare the next generation of agricultural extension professionals to handle extension service delivery competently.
- Introduce new/improved curricula for agricultural extension training in Africa.

1.8 Organization of the Report

Chapter 1 provides an overview of agriculture and agricultural extension in South Africa. A theoretical background on the importance of requirements of efficient agricultural extension and advisory services is provided in Chapter 2 of the report. This is followed by a discussion of the structure and layout of agricultural extension training in South Africa, detailing the curricula contents of the available qualifications.

Chapter 3 details the methodology used in the study. Chapter 4 reports on the online survey results and discusses the findings thereof. Chapter 5 concludes with policy implications and suggestions for revitalizing agricultural extension curricula in South Africa.

CHAPTER 2 : THEORETICAL ORIENTATION

PROCESS SKILLS AND COMPETENCY GAPS IN AGRICULTURAL EXTENSION CURRICULA

2.1 Agricultural Extension and Advisory Services

Globally and in South Africa, the need for the AEAS profession to change from a top-down, production-focused approach to a more participatory and holistic approach has been reiterated (Davis et al., 2021b; Anandajayasekeram et al., 2007). According to the latest government review (DALRRD, 2020), an efficient agricultural extension practitioner must be:

i. Knowledgeable of the technical aspects of the production of a wide variety of agricultural products and/or able to research them.
ii. Client-orientated and customer- focused.
iii. Able to relate with a variety of participants while communicating clearly and appropriately; equipped with the relevant interpersonal skills.
iv. Able to execute project planning, management, and evaluation according to specific outputs.
v. Able to manage knowledge, acquire and share it with all the relevant stakeholders to enhance productivity and profitability.
vi. Competent in in-service delivery innovation.
vii. Efficient in problem solving and analysis.
viii. Honest and of the highest integrity.
ix. Able to provide advice to producers on value chain processing and market linkages.
x. Knowledgeable of climate-smart agriculture.
xi. Able to manage and encourage people to reach their full potential.
xii. Understanding of diversity and inclusivity in terms of gender challenges in agriculture, specifically.

2.2 Overview of Agriculture Education in South Africa

The National Qualifications Framework (NQF) is the guide for education and qualifications in South Africa. It is rooted in the labor movement that started in the 1970s when there was a struggle by black labor unions to get better wages for their unskilled members (The South African Qualifications Authority, (SAQA) 2020). The South African Qualifications Authority (SAQA) was enacted in 1995. In 2008, the National Qualifications Framework Act was implemented to coordinate education and training and meet the country's training needs. The framework provides learning pathways and options for skills development to bring about better employment opportunities (SAQA, 2020).

NQF levels range from 1 to 10 (Figure 6). Levels 1-3 include adult education and training. Levels 1-4 are the general and further education and training subframework. Levels 1-8 are the

occupational qualifications subframework. Levels 5-10 are the higher education subqualifications subframework.

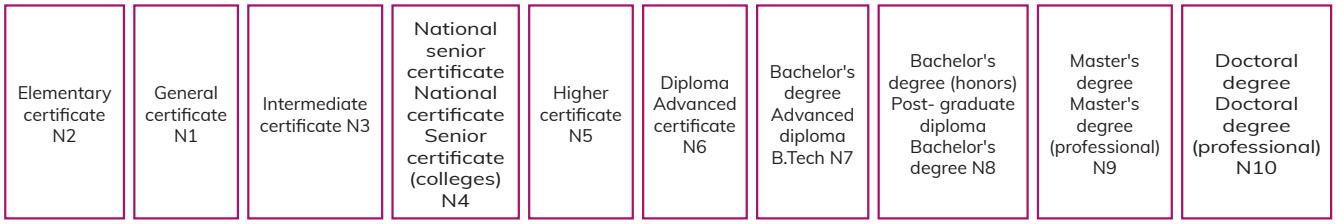

Figure 2.1 : National qualifications framework levels and qualification types

Source: Authors, based on https://www.saqa.org.za/

The South African process of developing a new degree/qualification is depicted in Figure 2.2:

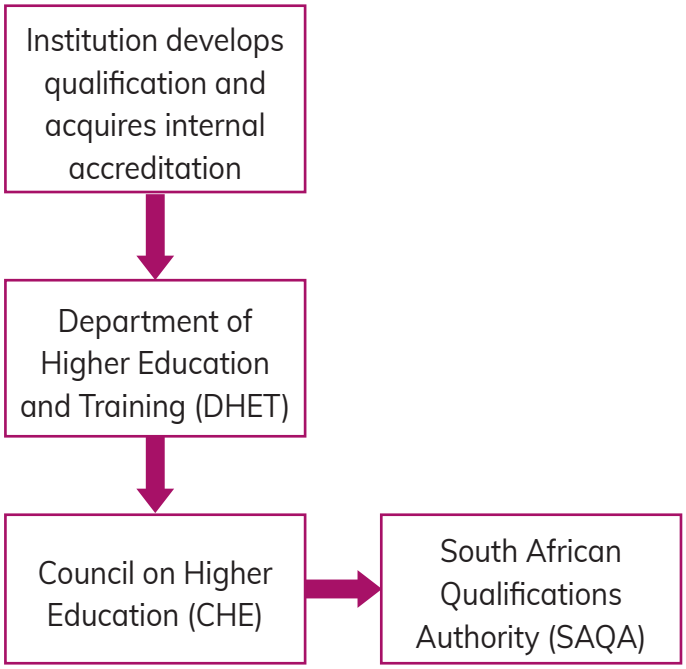

Figure 2.2 : Institutional process of developing a new degree/qualification in South Africa

Source: Authors

2.3 Agricultural Extension Curriculum at Undergraduate Level

Key role players in the sector have already identified the gaps in agricultural extension training.

"There is no shortage of registered qualifications in the field of agriculture in the National Qualifications Framework. To date, the focus has been primarily on production; yet, skills for the agricultural supply chain come from a wider range of disciplines than the specific agriculture- focused qualifications. There is an urgent need for improved relevance in the curricula. Although there are exceptions, students are primarily educated for commercial agriculture, with little focus on smallholder farmers (SHF) or on the social and human dimensions of agriculture. Linked to the need for relevance is the need for multi and transdisciplinary approaches to curricula that address modern-day topics, find solutions to

grand challenges, such as climate change, and drive economic development." (Academy of Science of South Africa, 2017, p.13).

"... the training of extension and advisory services practitioners at foundational level and beyond is a key challenge due to either the current curriculum design and/or lack of further technical, managerial and leadership training to stimulate innovations and institutional capacity..." (DALRD, 2020, p.8).

In South Africa, each institution develops its own agricultural extension agenda and curriculum. The contents of the extension qualifications taught at the different institutions vary. Some are still set on the traditional extension approach of improving production and output; others have evolved to use a more holistic approach that includes the many aspects and challenges involved in rural agriculture.

Currently, 25 higher education institutions offer some form of training in agricultural extension. The available courses are listed in Tables 2.1-2.3:

Table 2.1 : Available undergraduate agricultural extension qualifications at higher institutions in South Africa

	Institution	Available qualification	NQF	Contents summary
UNDERGRADUATE QUALIFICATIONS & DIPLOMAS	University of Kwazulu Natal	B.(Agric) Agricultural Extension	7	**First year:** Farming Systems; Agricultural Production; Rural Wealth Creation; Rural Economic Systems; Production Economics and Marketing; Farm Infrastructure & Machinery; Natural Resource Identification; Impact on Natural Resources
				Second year: Field Crop Production; Intensive Livestock Production; Forage Livestock Production; Plant Propagation; Extension Methods; Extension Practice; Farm Business Management; Farm Development/ Basic IsiZulu Language Studies; Land Preparation
				Third year: Designing Extension Projects; Participatory Extension; Extension Placement; Farm Finance; Land Use Planning
	University of Fort Hare	B.(Agric) in Agricultural Extension/ Production	7	**First year:** Basic Chemistry; Biology; Introduction to Scientific Concepts; Introduction to Agric Economics; Elements of Agro Meteorology; Introduction to Crop Science; Marketing of Agricultural Products; Intro to Computers and Computing Theory

				Second year: Introduction to Animal Science; Introduction to Pasture Ecology; Introduction to Soil Science; Principles of Crop Production; Introduction to Seminar Writing; Introduction to Agric Engineering; Pedology; Farm Management; Introduction to Agricultural Extension; Veldt & Cultivated Pasture Management; Principles of Animal Nutrition
				Third year: Plant Pest Control; Elements of Horticultural Science; Agronomy of Summer Crops; Land Use Planning; Small stock Production; Practical agricultural experience; Elementary Animal Health; Agricultural Extension & Human Development; Applied Extension & Rural Development; Seminar in Agricultural Extension; Project in Land Use Planning
	University of the Free State	B.(Agric) in Agriculture majoring in Agricultural Extension	7	**First year:** Biological Principles in Agriculture; Mathematical and Biometrical Principles in Agriculture; Chemical Principles in Agriculture; Physical and Mechanized Principles in Agriculture; Introduction to Soil, Crop, and Climate Sciences; Introduction to Agricultural Economics; Introduction to Animal, Wildlife, and Grassland Science
				Second year: Extension within the Agricultural Innovation System; Communication for Innovation; Introductory Ruminant Production; Introduction to Animal and Plant Breeding
				Third year: Facilitation for Development; Extension Program Management; Community Mobilization and Local Organizational Development; Management of Change and Adaptation; Agricultural Entrepreneurship and Value Chains; Adult Learning, Behavioral Change and Gender

				Electives: Introductory Ruminant Production; Introductory Monogastric Production; Animal Production Practical; Sustainable Soil and Water Management; Grassland Ecology; Game and Natural Environment Interaction
	University of Mpumalanga	Bachelor of Agriculture in Agricultural Extension and Rural Resource Management	7	**First year:** Plant Protection; Rural Wealth Creation; Introduction to Farm Management; Agricultural Engineering; Introduction to Soil Science; Computer Application for Extension; Plant Propagation; Rural Economic Systems; Farm Management; Agricultural Mechanization; Scientific Writing and Reporting for Agricultural Extension; Soil Science
				Second year: Introduction to Vegetable Production; Introduction to Agronomy; Introduction to Fruit Crop Production; Extension Methods; Budget and Risk Management; Introduction to Irrigation; Fruit Production; Agronomy Practices; Vegetable Production; Extension Practice; Managing Irrigation Systems
				Third year: Designing Agricultural Extension Projects; Developing a Farm business plan; Developing a Land Use Plan; Participatory Agricultural Extension; Extension Placement
	Tswane University of Technology (This qualification will be phased out 31 December 2022)	National Diploma: Agriculture: Development and Extension	6	**First year:** Agricultural Anatomy and Physiology I; Agricultural Calculations I; Agricultural Botany I; Agricultural Mechanization I; Soil Science I; Agricultural Extension I; Agricultural Economics I; Crop Production I; Crop Protection I; Soil Surveys II

				Second year: Agricultural Extension II; Agricultural Marketing II; Natural Pastures I; Agronomy II; Fruit Production II; Bee Production II/Small Stock Production II; Agricultural Extension III; Farm Planning I; Vegetable Production I; Agronomy/Fruit Production III; Beef/Small Stock Production III
				Third year: Work Integrated Learning
	Mangosuthu University of Technology	Diploma in Agricultural Extension and Community Development	6	Agricultural Extension; Basic Nutrition; Land Use Planning; Human Ecology; Basic Food; Computer Skills; Basic Science; Basic English; Health and Hygiene; Basic Skills; Basic Food
	International Agricultural Academy of Africa	National certificate in agricultural extension	6	Introduction to Agripedia; The Mental Approach to Agricultural Extension; Communication in Extension; Groups and Group Dynamics; Agricultural Extension as a Profession; Extension Projects and Programs; The Approach to Community Development; Evaluation in Extension; The Extension Officer as Educational Practitioner; Community Disaster Risk Management; Commercial Farm Planning

Source: Authors' compilation of available curricula from higher institutions

Table 2. 2: Available postgraduate agricultural extension qualifications at higher institutions in South Africa

	Institution	Available qualification	NQF	Contents summary
POST GRADUATATE QUALIFICATIONS	University of Kwazulu Natal	Bachelor of Agriculture (Honors)	8	Systems Thinking Foundations; Rural Development Placement; Advanced Extension Theory and Practice; Project Design and Management; Rural Development/Extension Research Project
		Master's degree in Agriculture	9	Various topics including Agricultural Extension and Rural Resource Management
	University of Pretoria	Bachelor of Agriculture (Honors) Extension	8	Leadership and Group Dynamics; Communication for Sustainable Rural Development; Principles and Approaches of Rural Development and Extension; Extension Program Planning and Management; Extension Program Evaluation and Research; Human and Organizational Behavior Change and Management; Principles and Approaches of Community Development
		Master's degree in Agriculture	9	Dissertation: Agrarian Extension
	University of Fort Hare	Bachelor of Agriculture (Honors) Extension	8	Basis & Philosophy of Agricultural Extension and Rural Development; Communication, Leadership and Management; Evaluation and Research; Dissertation; Seminars
		Master's degree in Agricultural Extension	9	Dissertation
		Ph.D. degree in Agricultural Extension	10	Dissertation

	University of Mpumalanga	Advanced Diploma in Agricultural Extension	7	Extension Theory and Practice; Planning Extension Programs and Projects; Strategic Management; Principles and Practice of Management for Development; Extension Experiential Learning
		Bachelor of Agriculture Honors in Agricultural Extension and Rural Resources Management	8	**First year:** Plant Protection; Rural Wealth Creation; Introduction to Farm Management; Agricultural Engineering; Introduction to Soil Science; Computer Application for Extension; Plant Propagation; Rural Economic Systems; Farm Management; Agricultural Mechanization; Scientific Writing and Reporting for Agricultural Extension; Soil Science
				Second year: Introduction to Vegetable Production; Introduction to Agronomy; Introduction to Fruit Crop Production (Citrus and Subtropical); Extension Methods; Budget and Risk Management; Introduction to Irrigation; Fruit Production; Agronomy Practices; Vegetable Production; Extension Practice; Extension Practice; Managing Irrigation Systems
				Third year: Designing Agricultural Extension Projects; Developing a Farm Business Plan; Developing a Land Use Plan; Participatory Agricultural Extension; Extension Placement
		Master's of Agriculture in Agricultural Extension	9	Dissertation
	University of Limpopo	Master's degree in Agricultural Extension	9	Dissertation

	University of North West	Postgraduate diploma in Agricultural Extension	8	Agriculture and Economic Development; Rural Community Development; Essentials of Agricultural Extension; Elements of Communication in Agricultural Extension; Agricultural Project Appraisal; Change in Agriculture; Leadership Development in Agricultural Extension; Research Methods and Project
		Master's degree in Agricultural Extension	9	Dissertation
		Ph.D. degree in Agricultural Extension	10	Dissertation
	Mangosuthu University of Technology	Advanced diploma in Agricultural Extension and Community Development	7	Biometry IV; Agri-business Management; Food and Food Processing IV; Research Methodology IV; Extension IV; Nutrition IV; Human Ecology IV; Land Use Planning IV; Water Management IV; Food Security IV; Agro-Processing IV; Agronomy IV; Principles of Fruit and Vegetable Production IV; Electives: Small Stock Production IV; Poultry Production IV
	Central University of Technology	Advanced diploma in Agricultural Extension	7	Economics for Extension; Project Planning, Implementation & Evaluation in Extension; Behavior Change & Intervention in Extension; Extension & Advisory principles & Approaches; Leadership, Group Dynamics & Networking in Extension Electives: Plant Production; Animal Production

Source: Authors' compilation of available curricula at higher institutions

Table 2.3 : Institutions that include agricultural extension subjects in other agricultural qualifications

Institution	Extension Subjects included in other agricultural qualifications
Mangosuthu University of Technology	Agricultural Extension I, II, III
University of South Africa	Community Extension Practice; Extension Leadership and Group Dynamics; Participatory Approaches to Extension
University of the Free State	Extension for Sustainability
	Sustainable Agriculture and Extension: Theory and Practice
North West University	Fundamentals of Agricultural Extension; Communication and Agricultural Technology Transfer; Agricultural Extension for Development; Agricultural Rural Sociology
University of Venda	Introduction to agricultural Extension; Communication and Extension for Rural Development; Advanced Agricultural Extension Education
University of Zululand	Introduction to Extension and Rural Development; Extension Methods; Internship for Extension & Rural Development; Agricultural Extension
Cape Peninsula University of Technology	Agricultural Extension and Extension Science

Source: Authors' compilation of available curricula at higher institutions

According to the latest information, qualifications held by South African agricultural extension practitioners are as follows:

Table 2.4 : Qualifications of South African agricultural extension practitioners by province

Province	*No. of Extension Practitioners	Qualifications		Percentage compliance to norms and standards (%)
		Less than 4-year qualification in agriculture	4-year qualification in agriculture or higher	
Eastern Cape	571	286	285	50
Free State	120	16	104	87
Gauteng	124	4	120	97
KwaZulu-Natal	750	243	507	68
Limpopo	538	104	434	81
Mpumalanga	228	45	183	80
Northern Cape	56	2	54	96
North West	194	15	179	92
Western Cape	71	2	69	97
Total	2652	717	1935	73 (average)

Source: DAFF, 2015

The statistics in Table 2.4 show that 593 (23%) out of 2652 extensionists have less than a degree. Overall, 2,031 (77%) of the extension personnel meet the minimum requirement for a four-year degree in agriculture or higher. This implies that most of the practitioners in the country meet the minimum required qualifications for agricultural advisors. The Eastern Cape has the lowest percentage (50%) of practitioners with a minimum 4-year qualification in agriculture and/or higher. The Western Cape and Gauteng provinces have the highest percentage of practitioners - at 97% each - that meet the requirement set by the Norms and Standards for Extension and Advisory Services in Agriculture, followed by Northern Cape province at 96% and the North West province at 92%.

CHAPTER 3 : METHODOLOGY

3.1 Study Locale and Sampling

The study commenced with focus group discussions (FGDs) among key role players such as extension workers and educators. An online questionnaire was then made available to gather relevant data to answer the research questions.

Purposeful sampling was used to select appropriate participants for the focus group discussions. Purposeful sampling in qualitative research implies selecting participants that can actively contribute to the research problem through their knowledge and expertise (Luciani et al., 2019). The selection criteria were that participants had to be involved in agricultural extension through either the private or the public sector or via training institutions in South Africa. The research team identified suitable participants from a database of extension professionals and key informants, and available public information.

A total of 38 potential participants were identified and invited to the focus group discussions through an informative email. Twenty-one participants replied and took part in the FGDs over three separate meetings. Of the 21 participants, nine were from tertiary training institutes across South Africa, seven were from agricultural producer organizations providing AEAS to producers, and five worked for the Department of Agriculture, Land Reform and Rural Development in various provinces. Fifteen of the participants were male, and six were female.

Two of the participants could not find a suitable time to attend and returned their answers to the questions via email.

Data for the quantitative study was obtained through an online survey targeted at the entire set of extension staff in South Africa. The invitation to participate in the survey was purposefully sent to a variety of stakeholders. These included:

- Public- sector extension professionals on all levels of the field, from operational to heads of departments.
- Private- sector extension professionals.
- Participants involved in teaching agricultural extension.
- Postgraduate students in extension.

Heads of extension departments in each province in the country was asked to distribute the questionnaire amongst their staff members. Only 65 respondents completed the questionnaire, despite the fact that there are some 2000 plus extension staff. Some respondents only provided partial responses. “Questionnaire fatigue” of participants could be a possible explanation for the low number of responses.

3.2 Operationalization and Measurement of Variables

3.2.1 Process Skills and Core Competencies

The competencies and skills needed by an extension professional can be divided into two categories: process skills and competencies, and technical skills (Suvedi and Kaplowitz, 2016).

The process skills and core competencies observed in the study and covered in the online survey (Annexure 1) included the following:

- **Program planning skills and competencies:** "Program planning skills and competencies" was operationalized as being familiar with the vision, mission, and goals of the national extension service and agricultural development strategies, able to conduct a needs assessment, able to conduct benchmark studies, able to mobilize resources, able to engage local stakeholders, and being familiar with administrative and financial rules of respective organizations. Six items in the questionnaire assessed this area of competency.
- **Program implementation skills and competencies:** "Extension program implementation skills and competencies" was operationalized as the ability of agricultural extension professionals to coordinate extension programs, demonstrate teamwork and negotiation skills, engage diverse local stakeholders, delegate responsibilities, and follow participatory decision making in extension work. Nine questionnaire items assessed this competency.
- **Communication and public relations skills and competencies:** "Communication and public relations skills and competencies" was operationalized as the ability of agricultural extension professionals to select appropriate communication methods, respect local culture, prepare reports of their work, share success stories and lessons learned, use various communication channels to disseminate information about important extension activities and programs, and possess good listening and public speaking skills. Eight questionnaire statements were administered to assess this competency.
- **Information and communication technologies (ICTs) skills and competencies:** "ICTs skills and competencies" was operationalized as the ability of extension professionals to use Microsoft Office, computers, audiovisual aids, mass media, mobile phones, and social media for communication, teaching, and learning. The questionnaire used eleven items to assess this competency.
- **Program monitoring and evaluation skills and competencies:** "Program monitoring and evaluation skills and competencies" was operationalized as the ability of agricultural extension professionals to understand monitoring and evaluation concepts, conduct monitoring and evaluation of extension programs, develop data collection instruments, apply qualitative and quantitative tools to collect evaluation data, analyze data, write evaluation reports, and share results with stakeholders. Eleven questionnaire items were administered to assess this competency.
- **Personal and professional development skills and competencies:** "Personal and professional development skills and competencies" was operationalized as the ability of agricultural extension professionals to practice principles of good governance,

show commitment to career advancement, apply professional ethics in work, follow organizational policies and directives, and demonstrate positive attitudes toward extension work. Five questionnaire items were administered to assess this competency.

- **Diversity and gender skills and competencies:** "Diversity and gender skills and competencies" was operationalized as the ability of agricultural extension professionals to understand the diversity within and among stakeholders, identify their needs, and develop extension programs to benefit and engage women and various social and marginalized groups and do teamwork with diverse staff members at various levels. The questionnaire included six items to assess this competency.
- **Marketing, brokering, and value chain development competencies and skills:** "Marketing, brokering, and value chain development competencies and skills" was operationalized as the ability of agricultural extension professionals to apply brokering/advisory skills in an agribusiness environment with sufficient knowledge of agricultural markets and linkages, facilitate entrepreneurship, and link relevant role players together. Six questionnaire items assessed this competency.
- **Soft skills:** "Other extension soft skills" was operationalized as the ability of agricultural extension professionals to use skills including critical thinking, problem solving, time management, stress management, leadership, teamwork, flexibility, self-motivation, interpersonal skills, positive work attitude, collaboration, conflict management, group formation and development, negotiation skills, networking skills, facilitation skills, and creativity to enhance the efficiency and effectiveness of their service. Seventeen questionnaire items assessed this competency.
- **Nutrition skills and competencies:** "Nutrition skills and competencies" was operationalized as the ability to demonstrate knowledge of basic human nutrition, understanding the life-cycle nutritional needs of various household members, crop selection to ensure balanced diets, improving gender relations for increased agricultural production and nutrition, demonstrating postharvest handling technologies to conserve nutrients in food, having basic knowledge about food labeling, and ability to advise on healthy diets. Seven questionnaire items assessed this competency.
- **Technical subject matter expertise/skills and competencies:** "Technical subject matter expertise/skills and competencies" was operationalized as the ability of agricultural extension professionals to demonstrate basic technical knowledge, understand adult learning principles, understand the new technology being promoted, educate community members about various types of risks and uncertainties, educate community members on climate change and climate-smart agriculture, refer to and produce publications, harness and integrate local/indigenous knowledge, and understand the social system under which farming takes place. Eleven questionnaire items assessed this competency.

Respondents were asked to answer two questions about each of the above skills and competencies using the Likert scale described below:

- How important is this skill or competency for an extension worker?

  1 = Not Important

  2 = Somewhat Important

  3 = Moderately Important

  4 = Important

  5 = Very Important

- How well does the undergraduate extension curriculum cover this competency?

  1 = Not at all covered

  2 = Minimally covered

  3 = Moderately covered

  4 = Well covered

  5 = Very well covered

3.2.2 Additional Information about Competencies: "Additional information about competencies" was operationalized by asking participants to list any skills and competencies not mentioned in the questionnaire that they value as important.

3.2.3 Making agricultural extension robust and practical: "Strategies to make agricultural extension curricula robust and practical" was operationalized by asking participants to indicate whether certain strategies for improvement already existed in their curricula. If not, whether they are considered essential, important, or merely good to have. These strategies include providing practical skills through mentorship; including soft skills in the extension curriculum; exposing students to market opportunities and developing entrepreneurship; including business management concepts in the extension curriculum; incorporating youth development, gender issues, and climate change concepts in the extension curriculum; recruiting extension faculty staff with relevant knowledge and experience ; including research skills and emphasizing ICT skills in the curriculum.

3.3 Appropriate Ways to Acquire Core Competencies

Participants were asked to rate appropriate ways to acquire core competencies as either being not appropriate, somewhat appropriate, appropriate, or very appropriate. Methods to acquire core competencies included preservice training, internships, basic induction training, in-service training, and training through seminars, workshops, and webinars.

Open-ended questions were also used to ask respondents to list any process skills or competencies not mentioned in the questionnaire.

3.4 Major Barriers to Effective Implementation of Extension Curriculum

Major barriers to effective implementation of extension curriculum were operationalized by asking participants to select from all the applicable aspects listed below:

- Development of an effective extension curriculum.
- Quality faculty to teach extension courses.
- Quality textbooks and/or manuals.
- Classroom and demonstration farms or facilities.
- Accreditation.
- Time constraints
- Budget to support practical learning experience (e.g., field visits and demonstrations).
- Student motivation to study extension and engage in practical extension work.
- Teacher motivation to teach required process skills and competencies.
- Other (please specify) _

3.5 Design and Development of the Survey Instrument

The questionnaire used in the survey was developed collaboratively by faculty members of the Michigan State University, University of Nigeria, Lilongwe University of Agriculture and Natural Resources (Malawi), Makerere University (Uganda), University of Pretoria (South Africa), University of the Free State (South Africa), and Indira Gandhi National Open University (India).

3.6 Data Collection and Analysis

The researchers submitted lists of contact details of agricultural extension professionals in each country. In South Africa, the list was compiled using contact details of private- sector companies, grower and commodity organizations, university personnel, members of the South African Society of Agricultural Extensionists, and postgraduate students. A list of 288 individuals was compiled. Three reminders were sent to non-respondents to increase the poor response rate.

3.7 Focus Group Discussions

To collect qualitative data on the topic, focus group discussions (FGDs) were held on 9, 10, and 11 November 2021. The objectives of these FGDs were to gather qualitative information, including perceptions of local agricultural contexts, critical job skills, and core competencies required of extension workers, their coverage in the current undergraduate (UG) curriculum, and the barriers to effective training of extension workers. Given the diversity of locality of the participants and the constraints of the COVID-19 pandemic, the FGDs were conducted online using Microsoft Teams software. The goal of the FGDs was explained to participants with the purpose statement (Annexure-2):

We have asked you to join us today to hear your views on the extension and advisory services curricula in South Africa. Specifically, we are interested in your thoughts and opinions regarding how extension and advisory services can address the evolving needs of South African farmers, agribusinesses, and other role players.

A total of 38 potential participants were identified and invited to the focus group discussions through an informative email. Twenty-one participants replied and took part in the FGDs over three meeting days. Of the 21 participants, nine were from tertiary training institutes across South Africa, seven were from agricultural producer organizations providing AEAS to producers, and five worked for the Department of Agriculture, Land Reform and Rural Development in various provinces. Fifteen of the participants were male, and six were female.

Two participants could not find a suitable time to attend and returned their answers to the questions via email. Six questions were asked in the discussions, detailed in Chapter 4.

3.8 Limitations of the Study

Care was taken to collect objective, unbiased data. The limited responses to the online questionnaire were disappointing. However, the focus group discussions were very fruitful, and the researchers believe that combining the two has produced valuable findings.

CHAPTER 4 : RESULTS AND DISCUSSION

4.1 Demographics of Agricultural Extension Professionals

Table 4.1 indicates that the majority (28.9%) of the respondents were in the age group of 41-50 years of age, 48% of the respondents who answered the question were male, and 50% were female. The majority (55.8%) had a bachelor's degree qualification, 28.9% had master's degrees, and 15.4% had Ph.D. degrees.

Table 4.1 : Demographics of agricultural extension professionals in South Africa

Category	Frequency	Percentage
1. Age of respondents (in years) (N=52)		
21-30	10	19.23
31-40	11	21.15
41-50	15	28.85
51-60	11	21.15
above 60	5	9.62
Total	52	100.00
2. Gender of respondents (N=52)		
Male	25	48.08
Female	26	50.00
Prefer not to respond	1	1.92
Total	52	100.00
3. Education (N = 52)		
Bachelor's degree/HND	29	55.8
Master's degree	15	28.9
Doctoral (Ph.D.) degree	8	15.4
Total	52	100.00

4.2 Institutional Characteristics of the Agricultural Extension Professionals

Table 4.2 shows that 74.2% of the respondents had a deep knowledge of the undergraduate curriculum of a specific university. The majority (75.4%) of the respondents were familiar with the current undergraduate agricultural extension curriculum available in the country; 24.6% of them were not familiar. Also, a greater proportion (42.3%) of the respondents were

public- sector extension professionals, while 21% were private- sector extension professionals, among others. A significant proportion (26.5%) of the respondents indicated that they had spent over 20 years in the extension profession, but 24.5% had spent between 0 and 5 years, among others.

Table 4.2 : Institutional characteristics of the agricultural extension professionals in South Africa

Category	Frequency	Percentage
1. Familiarity with UG extension curriculum (N = 65)		
Familiar	49	75.38
Not familiar	16	24.62
Total	65	100.00
2. Familiar with how many universities' UG agriculture extension curriculum (N = 62)		
Number of universities		
1	46	74.19
2-3	9	14.52
4 or more	7	11.29
Total	62	100.00
3. Current position (N = 52)		
Private- sector extension professional	11	21
Extension staff in a university	6	11.5
Extension researcher	5	9.6
Public- sector extension professional	22	42.3
Other (Please specify)	8	15.4
Total	52	100.00
4. Years in extension profession or agriculture- related fields (N = 49)		
0-5 years	12	24.49
6-10 years	6	12.24
11-15 years	11	22.45
16-20 years	7	14.29
Above 20 years	13	26.53
Total	49	100.00

4.3 Process Skills and Core Competencies

4.3.1 Program planning skills and competencies

The respondents considered all six program planning skills and competencies essential to the extension profession (Table 4.3). When asked how well the current extension curricula covered each specific skill or competency, the respondents indicated they were moderately well covered.

Table 4.3 : Program planning skills and competencies

	How important is this skill or competency for an extension worker? (N=57)*	**How well does the undergraduate extension curriculum cover this skill or competency? (N=40)****	
Extension professionals should be:	Mean (SD)	Mean (SD)	Mean difference
Familiar with the vision, mission, and goals of national /state (sub-national) extension service and agricultural development strategies, programs, and policies.	4.53 (0.92)	3.80 (1.03)	0.73
Able to conduct needs assessment and engage stakeholders to prioritize local needs.	4.57 (0.80)	3.73 (1.07)	0.84
Able to conduct baseline or benchmark studies.	4.40 (0.88)	3.73 (0.87)	0.67
Able to mobilize resources/funds to address priority needs.	4.33 (1.02)	3.29 (1.10)	1.04
Able to engage local stakeholders (e.g., NGOs, cooperatives, local agro-dealers) in extension program planning.	4.60 (0.73)	3.68 (1.05)	0.92
Familiar with administrative and financial rules of their respective organizations (to utilize human and financial resources in extension programs).	4.33 (0.89)	3.23 (1.25)	1.10

* *Scale for importance: 1 = Not important, 2 = Somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered*

4.3.2 Program implementation skills and competencies

Table 4.4 indicates that all of the nine program implementation skills and competencies were considered to be important for an extension worker. The respondents further indicated that each of the underlisted program implementation skills and competencies were moderately covered in the undergraduate extension curriculum.

Table 4.4 : Program implementation skills and competencies

	How important is this skill or competency for an extension worker? (N=55)*	**How well does the undergraduate extension curriculum cover this skill or competency? (N=38)****	
Extension professionals should be able to:	Mean (SD)	Mean (SD)	Mean difference
Coordinate local extension programs and activities.	4.68 (0.66)	3.85 (1.06)	0.83
Demonstrate teamwork skills to achieve extension results.	4.71 (0.49)	3.82 (1.09)	0.89
Form farmers' groups and support them.	4.68 (0.61)	3.68 (1.02)	1
Engage local stakeholders (e.g., NGOs, self-help groups, cooperatives) in implementing extension programs.	4.52 (0.66)	3.53 (1.06)	0.99
Demonstrate negotiation skills to reach consensus and resolve conflicts.	4.61 (0.68)	3.47 (1.06)	1.14
Follow participatory decision making in extension work.	4.55 (0.74)	3.87 (1.04)	0.68
Delegate responsibilities to staff as needed.	4.22 (0.81)	3.21 (1.17)	1.01
Be able to engage minority groups (e.g., female farmers and youth development groups) in extension work.	4.45 (0.89)	3.66 (1.02)	0.79
Integrate private or public-private partnerships in extension service provision.	4.57 (0.76)	3.45 (1.03)	1.12

* *Scale for importance: 1 = Not important, 2 = Somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.3 Communication skills and competencies

The respondents indicated that all the communications skills and competencies were important, as shown in Table 4.5. Furthermore, the respondents considered all the communication skills and competencies to be "very well covered" in the undergraduate extension curricula except "preparing required progress reports" and "sharing success stories and lessons learned with stakeholders through various media". These two skills and competencies were "moderately well covered" in the UG extension curriculum.

Table 4. 5: Communication skills and competencies

	How important is this skill or competency for an extension worker? (N=56)*	**How well does the undergraduate extension curriculum cover this skill or competency? (N=38)****	
Extension professionals should be able to:	Mean (SD)	Mean (SD)	Mean difference
Select appropriate communication methods.	4.63 (0.56)	4.08 (1.06)	0.55
Establish communication with different stakeholders.	4.61 (0.65)	4.00 (0.96)	0.61
Respect local culture while communicating with clients.	4.55 (0.71)	4.03 (0.97)	0.52
Prepare required progress reports.	4.59 (0.63)	3.95 (1.01)	0.64
Share success stories and lessons learned with stakeholders through various media.	4.50 (0.76)	3.71 (1.09)	0.79
Use extension methods (e.g., individual, group, and mass contact methods) to disseminate information about extension activities and programs.	4.66 (0.64)	4.13 (0.84)	0.53
Demonstrate good listening skills and listen to all clients and stakeholders.	4.70 (0.57)	4.00 (0.93)	0.7
Demonstrate good public speaking and presentation skills.	4.66 (0.58)	4.16 (0.92)	0.5

* *Scale for importance: 1 = Not important, 2 = Somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.4 Information and communication technologies (ICTs) skills and competencies

The respondents considered all eleven ICT skills and competencies to be important. They also indicated that the UG extension curriculum moderately covered these skills except Microsoft Word, which was considered very well covered (Table 4.6).

Table 4.6 : Information and communication (ICTs) skills and competencies

	How important is this skill or competency for an extension worker? (N=53)*	**How well does the undergraduate extension curriculum cover this skill or competency? (N=36)****	
Extension professionals should be able to use:	Mean (SD)	Mean (SD)	Mean difference
Microsoft Word for word processing (e.g., typing, editing, printing) and designing graphics.	4.53 (0.70)	4.00 (1.04)	0.53
Data entry and analysis software such as Excel, SPSS, etc.	4.53 (0.64)	3.67 (1.12)	0.83
Microsoft Power Point for making presentations.	4.55 (0.70)	3.92 (1.08)	0.63
Audiovisual aids such as charts, graphs, and puppet shows for teaching and learning.	4.50 (0.77)	3.78 (0.85)	0.72
Mass media such as FM radio stations and television channels for communication.	4.26 (1.01)	3.30 (1.18)	0.96
Computers (email, Internet) for communication	4.61 (0.66)	3.92 (1.12)	0.69
Mobile phone services (e.g., texting, SMS service) for communication.	4.59 (0.74)	3.65 (1.16)	0.94
Social media (WhatsApp, Facebook, Twitter, Instagram, etc.) for communication.	4.50 (0.72)	3.62 (1.06)	0.88
ICT tools to improve access to information, knowledge, technologies, and other innovations.	4.41 (0.84)	3.38 (1.04)	1.03
ICT tools to enhance collaboration and partnerships.	4.44 (0.63)	3.35 (1.06)	1.09

ICT tools for collecting data, monitoring, and evaluating extension programs.	4.48 (0.72)	3.24 (1.06)	1.24

* *Scale for importance: 1 = Not important, 2 = Somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.5 Program monitoring and evaluation skills and competencies

Table 4.7 shows that the respondents rated all eleven program, monitoring and evaluation skills and competencies to be important, and they indicated that the UG extension curriculum moderately covers them.

Table 4.7 : Program monitoring and evaluation skills and competencies

	How important is this skill or competency for an extension worker? (N=53)*	**How well does the undergraduate extension curriculum cover this skill or competency? (N=36)****	
Extension professionals should:	Mean difference	Mean (SD)	Mean (SD)
Understand theories and principles of monitoring and evaluation.	4.61 (0.60)	3.86 (0.95)	0.75
Conduct monitoring and evaluation of extension programs.	4.72 (0.53)	3.67 (0.96)	1.05
Develop data collection instruments -- interview schedules / questionnaires-- for monitoring and evaluating extension programs.	4.58 (0.60)	3.78 (1.05)	0.8
Conduct online surveys for monitoring and evaluating extension programs.	4.25 (0.92)	3.33 (1.15)	0.92
Apply qualitative tools and techniques (e.g., focus group discussion, case study etc.) to collect evaluation data.	4.62 (0.63)	3.67 (0.96)	0.95
Apply quantitative tools and techniques (e.g., survey, interview, farm data, etc.) to collect evaluation data.	4.55 (0.64)	3.64 (0.93)	0.91
Analyze data (qualitative and quantitative).	4.64 (0.56)	3.75 (1.00)	0.89

Interpret data (qualitative and quantitative).	4.64 (0.56)	3.69 (0.98)	0.95
Write evaluation report.	4.58 (0.60)	3.75 (0.97)	0.83
Share evaluation reports within their organizations and with stakeholders.	4.60 (0.66)	3.44 (0.97)	1.16
Apply the evaluation findings in replicating/ scaling up of extension programs.	4.60 (0.69)	3.42 (1.05)	0.58

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4.3.6 Personal and professional skills and competencies

The respondents considered the five personal and professional skills and competencies to be important. They also indicated that the various skills and competencies were moderately covered in the UG extension curriculum (Table 4.8).

Table 4.8 : Personal and professional skills and competencies

	How important is this skill or competency for an extension worker? (N=52)*	**How well does the undergraduate extension curriculum cover this skill or competency? (N=35)****	
Extension professionals should:	Mean (SD)	Mean (SD)	Mean difference
Apply principles of good governance (e.g., client's participation, accountability, and transparency) in extension work.	4.64 (0.71)	3.81 (1.01)	0.83
Show commitment to career advancement (participate in lifelong learning, in-service training, professional development events and conferences).	4.58 (0.67)	3.66 (1.19)	0.92
Apply professional ethics in extension work -- i.e., promote research-based recommendations or technology.	4.71 (0.54)	3.86 (0.88)	0.85
Follow organizational policies and directives for professional development.	4.58 (0.64)	3.46 (1.07)	1.12

Demonstrate honesty and positive attitude toward extension work.	4.83 (0.43)	3.86 (0.97)	0.97

* *Scale for importance: 1 = Not important, 2 = Somewhat important, 3 = Average, 4 = Important, 5= Essential.*

** *Scale for coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.7 Diversity and gender skills and competencies

The respondents rated all seven diversity and gender skills and competencies as important (Table 4.9). However, they indicated that skills such as "understand that diversity exists within and among clients and stakeholders", "identify the needs of small-scale farmers", and "identify the needs of minority groups" were very well covered in the UG extension curriculum. On the other hand, other skills were considered moderately covered in the UG extension curriculum.

Table 4.9 : Diversity and gender skills and competencies

	How important is this skill or competency for an extension worker? (N=52)*	**How well does the undergraduate extension curriculum cover this skill or competency? (N=35)****	
Extension professionals should:	Mean (SD)	Mean (SD)	Mean difference
Understand that diversity exists within and among clients and stakeholders.	4.60 (0.57)	4.08 (0.84)	0.52
Identify the needs of small-scale farmers.	4.67 (0.51)	4.14 (0.85)	0.53
Identify the needs of minority groups.	4.67 (0.62)	4.11 (0.80)	0.56
Develop extension programs to benefit women farmers.	4.60 (0.80)	3.89 (0.96)	0.71
Develop extension programs to benefit youth.	4.62 (0.66)	3.83 (1.04)	0.79
Engage marginalized and vulnerable groups in extension programs (e.g., disabled, resource- poor farmers).	4.60 (0.75)	3.71 (0.93)	0.89
Do teamwork with diverse staff.	4.58 (0.70)	3.83 (1.04)	0.75

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4.3.8 Marketing, brokering, and value chain development skills and competencies

The respondents indicated all six marketing, brokering, and value chain development skills were important and moderately covered in the UG extension curriculum (Table 4.10).

Table 4.10 : Marketing, brokering, and value chain development skills and competencies

	How important is this skill or competency for an extension worker? (N=51)*	**How well does the undergraduate extension curriculum cover this skill or competency? (N=34)****	
Extension professionals should:	Mean (SD)	Mean (SD)	Mean difference
Have basic knowledge of agribusiness development.	4.59 (0.64)	3.76 (0.92)	0.83
Apply brokering / advisory skills in agribusiness development.	4.43 (0.64)	3.50 (0.99)	0.93
Have knowledge on different agricultural markets and linkages.	4.69 (0.65)	3.76 (1.02)	0.93
Demonstrate knowledge of value chain logistics and input-output linkages in the value chain.	4.58 (0.64)	3.71 (1.10)	0.87
Facilitate entrepreneurship development among extension clients.	4.75 (0.48)	3.74 (1.05)	1.01
Be able to link farmers/ producers' organizations/cooperatives/agribusiness companies with market.	4.65 (0.74)	3.59 (1.05)	1.06

* *Scale for importance: 1 = Not important, 2 = Somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.9 Soft skills in extension

Results in Table 4.11 reveal that the respondents considered all the 17 soft skills listed as important for an extension worker. They indicated that skills such as teamwork, group formation and development, facilitation skills, critical thinking, positive work attitude, and conflict management were very well covered in the UG extension curriculum; other skills were moderately well covered in the curriculum.

Table 4.11 : Soft skills in extension

	How important is this skill or competency for an extension worker? (N=51)*	How well does the undergraduate extension curriculum cover this skill or competency? (N=34)**	
Extension professionals should possess other soft skills such as:	Mean (SD)	Mean (SD)	Mean difference
Critical thinking	4.71 (0.61)	4.00 (0.74)	0.71
Problem solving	4.80 (0.40)	3.91 (0.87)	0.89
Time management	4.67 (0.55)	3.97 (0.83)	0.7
Stress management	4.61 (0.67)	3.62 (0.89)	0.99
Leadership	4.78 (0.42)	3.97 (0.72)	0.81
Teamwork	4.76 (0.47)	4.12 (0.81)	0.64
Flexibility	4.65 (0.59)	3.89 (0.99)	0.76
Self-motivation	4.80 (0.40)	3.97 (1.00)	0.83
Interpersonal skills	4.71 (0.46)	3.97 (0.87)	0.74
Positive work attitude	4.78 (0.42)	4.00 (0.95)	0.78
Collaboration	4.69 (0.58)	3.94 (1.01)	0.75
Conflict management	4.65 (0.59)	4.00 (0.78)	0.65
Group formation and development	4.61 (0.67)	4.12 (0.77)	0.49
Negotiation skills	4.57 (0.73)	3.82 (0.87)	0.75
Networking skills	4.76 (0.47)	3.94 (0.74)	0.82
Facilitation skills	4.75 (0.48)	4.03 (0.72)	0.72
Creativity / Innovativeness	4.80 (0.45)	3.85 (0.89)	0.95

* *Scale for importance: 1 = Not important, 2 = Somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

** *Scale for coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.10 Health, nutrition, and sanitation skills and competencies

The respondents considered all the seven health, nutrition, and sanitation skills and competencies listed as important for extension professionals (Table 4.12). They also indicated that all but one skill was moderately well covered in the UG extension curriculum. The skill of “able to advise on a healthy diet” was reported to be minimally covered in the curriculum.

Table 4.12 : Health, nutrition, and sanitation skills and competencies

Extension professionals should:	How important is this skill or competency for an extension worker? (N=51)* Mean (SD)	How well does the undergraduate extension curriculum cover this skill or competency? (N=34)** Mean (SD)	Mean difference
Demonstrate basic human nutrition knowledge (e.g., food composition, balanced diet, supplements, nutritional composition of various foods, nutrition deficiency symptoms, etc.).	4.18 (0.87)	3.24 (1.10)	0.94
Understand life-cycle nutrition needs of different household members (e.g., children of various age groups, pregnant and breast-feeding mothers, elderly).	4.02 (1.09)	3.06 (1.10)	0.96
Be able to advise families on what crops and livestock to be produced to ensure balanced diets.	4.29 (1.04)	3.40 (1.26)	0.89
Advise families to improve gender relations for increased agricultural production and nutrition.	4.25 (1.02)	3.26 (1.16)	0.99
Demonstrate postharvest handling technologies that conserve nutrients and food safety (e.g., food storage, freezing fruits and vegetables, making pickles, jams, jellies).	4.45 (0.88)	3.26 (1.21)	1.19
Have basic knowledge about food labeling (e.g., organic foods).	4.22 (1.10)	3.15 (1.23)	1.07
Be able to advise on healthy diet (e.g., for fitness and sports, diabetes, cancer, and AIDS/HIV, heart health, kidney	4.02 (1.22)	2.82 (1.31)	
disease, osteoporosis; weight loss and obesity).			1.20

* *Scale for importance: 1 = Not important, 2 = Somewhat important, 3 = Average, 4 = Important, 5= Essential.*

** *Scale for coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered*

4.3.11 Technical subject matter expertise skills and competencies

The ten technical subject matter skills and competencies listed were regarded as important for extension professionals in carrying out their work, and the majority of them were considered moderately well covered in the UG extension curriculum. Skills such as "demonstrate technical knowledge in their basic discipline" and "understand adult learning principles and hold practical skills required to teach improved farming practices", however, were very well covered in the curriculum (Table 4.13).

Table 4.13 : Technical subject matter expertise/skills and competencies

	How important is this skill or competency for an extension worker? (N=50)*	**How well does the undergraduate extension curriculum cover this skill or competency? (N=34)****	
Extension professionals should:	Mean (SD)	Mean (SD)	Mean difference
Demonstrate technical knowledge in their basic discipline (e.g., field crops/livestock/ fishery/horticulture, etc.).	4.84 (0.42)	4.03 (0.94)	0.81
Understand adult learning principles and hold practical skills required to teach improved farming practices.	4.65 (0.56)	4.00 (0.73)	0.65
Understand the new technology being promoted -- i.e., what it is, why, and how it works.	4.73 (0.53)	3.76 (0.85)	0.97
Facilitate farmers to access inputs and services (e.g., credit, seed, fertilizers, feed, artificial insemination, etc.)	4.69 (0.62)	3.85 (1.02)	0.84
Be able to educate community members about different types of risks and uncertainties (e.g., due to market fluctuations, natural disasters, etc.).	4.63 (0.75)	3.82 (1.06)	0.81
Be able to educate community members about climate change and climate-smart agriculture.	4.67 (0.68)	3.76 (1.10)	0.91
Refer to and make use of publications-- journals, research reports, etc.	4.53 (0.70)	3.38 (1.18)	1.15
Generate knowledge or produce research reports / journal publications.	4.41 (0.75)	3.41 (1.21)	1.00

Be able to harness, document, validate and integrate local / indigenous knowledge.	4.54 (0.73)	3.65 (0.98)	0.89
Understand social system under which farming takes place (e.g., rural sociology knowledge).	4.56 (0.79)	3.65 (0.95)	0.91

* *Scale for importance: 1 = Not important, 2 = Somewhat important, 3 = Average, 4 = Important, 5= Essential.*

** *Scale for coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

4.3.12 Summary of process skills and core competencies among agricultural extension professionals

Table 4.14 reveals that the respondents considered all the eleven process skills and competencies as important for an extension worker. Based on their familiarity with the UG extension curriculum, they also regarded all but one skill as moderately well covered in the curriculum. Communication skills and competencies was considered very well covered in the UG extension curriculum.

Table 4.14 : Summary of process skills and core competencies among agricultural extension professionals both familiar and unfamiliar with the available curriculum

Extension process skills and competencies	How important is this skill or competency for an extension worker?*		How well does the undergraduate extension curriculum cover this skill or competency?**	
	N	Mean (SD)	N	Mean (SD)
1. Program planning	57	4.45 (0.69)	40	3.55 (0.82)
2. Program implementation	55	4.57 (0.53)	38	3.61 (0.83)
3. Communication	56	4.61 (0.50)	38	4.00 (0.76)
4. ICTs	53	4.48 (0.57)	36	3.63 (0.84)
5. Program monitoring and Evaluation	53	4.58 (0.48)	36	3.63 (0.83)
6. Personal and professional Development	52	4.67 (0.50)	35	3.72 (0.90)
7. Diversity and gender	52	4.62 (0.55)	35	3.94 (0.77)
8. Marketing, brokering, and value chain development	51	4.61 (0.53)	34	3.68 (0.95)
9. Extension soft skills	51	4.71 (0.41)	34	3.95 (0.72)
10. Nutrition	51	4.20 (0.88)	34	3.17 (1.08)
11. Technical subject matter	50	4.62 (0.52)	34	3.73 (0.75)

* *Scale for importance: 1 = Not important, 2 = Somewhat important, 3 = Average, 4 = Important, 5= Essential.*

** *Scale for coverage in UG courses: 1 = Not at all covered, 2 = Minimally covered, 3 = Moderately well covered, 4 = Very well covered, 5 = Extremely well covered.*

Table 4.15 further reveals that the respondents, whether familiar or unfamiliar with the UG extension curriculum, considered all the eleven process skills and competencies as important. Also, there were no significant differences in the importance of each of the listed skills and competencies between these two groups of respondents.

Table 4.15 : Summary of process skills and core competencies among agricultural extension professionals: those familiar with the contents of the curricula are compared with those not familiar with the contents of the curricula

	Familiar*		Unfamiliar*		Mean difference	t-value (2- tailed sig)	Df
	N	Mean (SD)	N	Mean (SD)			
1. Program planning	42	4.43 (0.71)	15	4.50 (0.67)	-0.07	-0.32 (0.75)	55
2. Program implementation	39	4.58 (0.48)	16	4.53 (0.65)	0.05	0.30 (0.77)	53
3. Communication	40	4.64 (0.45)	16	4.53 (0.61)	0.11	0.76 (0.45)	54
4. ICTs	38	4.58 (0.45)	15	4.23 (0.76)	0.35	2.11 (0.04)	51
5. Program monitoring and evaluation	38	4.62 (0.41)	15	4.47 (0.62)	0.15	1.04 (0.30)	51
6. Personal and professional development	37	4.69 (0.47)	15	4.61 (0.60)	0.07	0.47 (0.64)	50
7. Diversity and gender	37	4.66 (0.41)	15	4.50 (0.82)	0.16	0.94 (0.35)	50
8. Marketing, brokering, and value chain development	36	4.68 (0.41)	15	4.44 (0.74)	0.24	1.47 (0.15)	49
9. Extension soft skills	36	4.74 (0.38)	15	4.64 (0.49)	0.11	0.85 (0.40)	49
10. Nutrition	36	4.36 (0.72)	15	3.84 (1.14)	0.52	1.96 (0.06)	49
11. Technical subject matter	35	4.69 (0.40)	15	4.47 (0.72)	0.22	1.38 (0.17)	48

* *Scale for importance: 1 = Not important, 2 = Somewhat important, 3 = Average, 4 = Important, 5 = Essential.*

4.4 Additional process skills or competencies needed

In addition to the aforementioned process skills or competencies, the respondents indicated additional process skills or competencies required by extension professionals for carrying out their work, as summarized in Box 4.1.

Box 4.1 : Additional process skills or competencies needed by extension professionals

1. Sustainability in agriculture
2. Capacity building for farmers to deal with uncertainty in social, political, and economic environments
3. Expansive practical farming skills
4. Knowledge of beekeeping, hydroponics, aquaculture, and mushroom production
5. Rotational farming systems
6. Pest control training

4.5 Suggestions on Making the Agricultural Extension Curriculum More Robust and Practical

The respondents indicated that strategies such as grooming students with broad-based general agricultural courses (68.6%), including business management concepts and practices in extension curriculum (62.8%), providing practical and contemporary skills (61.5%), and including various soft skills in extension curriculum (60.8%), among others, already existed. More importantly, suggested strategies such as exposing students to market opportunities, linking farmers with service providers, developing entrepreneurship (74.0%), and making the undergraduate extension curriculum/pedagogy more ICT- oriented (66.0%), among others, were considered essential to have.

Table 4.16 : Suggested strategies on making the agricultural extension curriculum more robust and practical

Suggested strategies	Total	Already exists	Does not exist, but essential to have	Does not exist, but fine to leave out
Provide practical and contemporary skills (e.g., through mentored internship or attachment to a progressive farmer in a crop season).	52	32 (61.54%)	19 (36.54%)	1 (1.92%)
Include various soft skills in extension curriculum.	51	31 (60.78%)	19 (37.25%)	1 (1.96%)

Include business management concepts and practices in extension curriculum.	51	32 (62.75%)	17 (33.33%)	2 (3.92%)
Expose students to market opportunities, linking farmers with service providers, and develop entrepreneurship.	50	12 (24.00%)	37 (74.00%)	1 (2.00%)
Grooming students with broad-based general agricultural courses (e.g., crop and animal production, postharvest, marketing, and joint ventures) along with extension training.	51	35 (68.63%)	15 (29.41%)	1 (1.96%)
Incorporate youth development, gender issues, urban/suburban agriculture, and climate change concepts in extension curriculum.	50	24 (48.00%)	24 (48.00%)	2 (4.00%)
Recruit highly qualified extension staff or faculty.	50	30 (60.00%)	19 (38.00%)	1 (2.00%)
Include research and data analytical skills.	51	31 (60.78%)	16 (31.37%)	4 (7.84%)
Offer training of trainer workshops for extension faculty members.	51	25 (49.02%)	25 (49.02%)	1 (1.96%)
Develop cutting-edge and practical teaching/ learning resources – extension textbooks, practical handbooks, training manuals, etc.	51	27 (52.94%)	23 (45.10%)	1 (1.96%)
Undergraduate extension curriculum/ pedagogy should be more ICT- oriented	50	16 (32.00%)	33 (66.00%)	1 (2.00%)

4.6 Appropriate Ways to Acquire the Core Competencies

The respondents considered internship at various work environments (58.6%) and providing opportunities to attend trainings, seminars, workshops, webinars, etc. (50.0%), among others, as very appropriate ways to acquire the competencies. They also considered in-service training (68.0%), preservice training by revising or updating the curriculum (67.3%), basic induction training (64.7%), and internship at various work environments (56.9%), among others as important (Table 4.17).

Table 4.17 : Appropriate ways to acquire the core competencies

Ways to acquire competencies	Total	Not appropriate	Somewhat appropriate	Appropriate	Very appropriate
Through preservice training by revising or updating the curriculum	52	0 (0.00%)	9 (17.31%)	35 (67.31%)	8 (22.86%)

Requiring internship at various work environments (i.e., public institutions, NGOs, private companies, farmer organizations, cooperatives, etc.) during undergraduate programs	51	1 (1.96%)	4 (7.84%)	29 (56.86%)	17 (58.62%)
Through basic induction training (e.g., job orientation training at the beginning of job)	51	0 (0.00%)	5 (9.80%)	33 (64.71%)	13 (39.39%)
Through in-service training (e.g., training offered during employment at universities, training institutes/centers, etc.)	51	1 (2.00%)	3 (6.00%)	34 (68.00%)	13 (38.24%)
Providing opportunities to attend trainings, seminars, workshops, webinars, etc.	51	0 (0.00%)	3 (5.88%)	32 (62.75%)	16 (50.00%)

4.7 Major Barriers to Effective Implementation of Extension Curricula

The major barriers to effective implementation of the UG extension curricula as indicated by the respondents are budget to support practical learning experience (53.8%), student motivation to study extension and in practical extension work (40.0%), classroom and demonstration farms or facilities (38.5%), development of an effective extension curriculum and quality faculty to teach extension courses (27.6% each), time constraints and teacher motivation to teach required process skills and competencies (21.5% each), and quality textbooks and/or manuals (18.5%). Other barriers are practical knowledge of trainers, political appointments and barriers/ inappropriate professional classifications for development extension (SACNASP), and the lack of stable, technically competent public extension services and access to farms for experience training, among others (Table 4.18).

Table 4.18 : Major barriers to effective implementation of extension curricula

Barriers	N=65 (%)
Development of an effective extension curriculum	18 (27.6)
Quality faculty to teach extension courses	18 (27.6)
Quality textbooks and/or manuals	12 (18.5)
Classroom and demonstration farms or facilities	25 (38.5)

Accreditation of curriculum	10 (15.4)
Time constraints	14 (21.5)
Budget to support practical learning experience (e.g., field visits and demonstrations)	35 (53.8)
Student motivation to study extension and in practical extension work	26 (40.0)
Teacher motivation to teach required process skills and competencies	14 (21.5)
Other barriers	7 (10.7)
Factors mentioned on an individual basis:	
Practical knowledge of trainers	
Political appointments and barriers/ inappropriate professional classifications for development extension (SACNASP), and the lack of stable, technically competent public extension services	
Access to farms for experience training	
Blending farmers' activities with extension and teaching and research	
Linkage of extension curriculum with development agents	
High price for the extension fees	
Lack of agricultural vision by extension workers they tend to not carry out the vision effectively to be efficient.	

4.8 Outcome of Focus Group Discussions

The comparison of answers to questions per discussion group is presented in Tables 1-4 of the annexure to this article. A summary of the primary responses from all three groups per question is provided below.

4.8.1 Existing and required skills and competencies of efficient AEAS

Question 1 : *From your perspective, whether you know industry, teaching, research, etc., what are the critical job skills or what we would call core competencies required of agricultural extension and advisory service officers in both the public and private sectors?*

The discussions surrounding this question are grouped into four categories:

E. Technical skills

The following technical skills were highlighted by participants as essential:

- In-depth, practical production knowledge extended with specialization in particular skills related to the region employed in. For example, specializing in irrigation in an area where irrigation is applied.

- Knowledge of genetically modified crops and various certification schemes.
- Agro-processing skills.
- The ability to do research on an applicable problem and share information with clients.
- Resource management skills.
- Farm engineering knowledge.
- Knowledge of sustainable farming systems.

F. Facilitation and communication skills

Facilitation and communication skills were emphasized by all three groups.

- The ability to communicate with and facilitate effectively among all stakeholders (farmers, private and public sectors) is vital.
- The competency to transfer knowledge between various role players as well as understanding of other cultures and ethnic differences.
- The knowledge and ability to use information and communication technologies (ICTs) was mentioned as becoming increasingly important, especially given the challenges of the COVID-19 pandemic and with rural locations being far off and sometimes inaccessible.

G. Soft skills

- Attitudes such as accountability, enjoyment of people, empathy, and positivity were emphasized.
- Professional ethics, critical thinking, and problem solving were seen as very important.

H. Business management and marketing skills

- Knowledge of value adding and value chain management.
- Financial management skills.
- The ability to build farmers' capacity to manage their farming enterprises effectively and not be dependent on extension services forever.

Question 2 : *Does our extension curriculum effectively train students on the above job skills/ core competencies?*

The general consensus among the three focus groups was that the current extension curricula in South Africa do not produce competent AEAS professionals. However, it was highlighted that the curriculum should not be blamed for everything. In many instances, the curriculum is sufficient, but it needs to be followed up by practical training relevant to the contexts that students will work in. It is also unfair to expect a freshly graduated person to immediately dispense expert advice.

An experienced professor teaching in extension said: *"In many instances, diploma students are better equipped than students with degrees because the focus in the diploma curriculum*

is more on soft skills and practical skills and not so much on science. In one particular case where the extension department was moved from the university to the agricultural college of an institution, training improved drastically because it became more practical and valuable."

Increasing the practical exposure of students through fieldwork was reiterated by all of the participants. A private- sector participant actively involved in extension said: *"In many cases, the new extension officer does not know the differences between crops. This is a very big negative for their self-confidence. My personal view is that universities should concentrate on fieldwork and teach students how to use the science in practice."* It was mentioned that not only should students be exposed to farmers, but they should also be exposed to all the various role players in the agricultural system, including researchers, financial institutions, input suppliers, marketers, etc.

It was further stated that the lack of regular interaction between research and extension in practice leads to the lack of transfer of knowledge between researchers and farmers. It was suggested that this could be improved by regularly facilitating cooperation between these role players. Enhanced communication between the training institutions and the employers of extension staff would also result in greater efficiency.

Participants said that graduates do not have the necessary skills to interact with farmers because they are not exposed to them at the undergraduate level. They lack problem- solving and critical- thinking skills. For example, if they advise a farmer to apply fertilizer and the farmer says that he/she cannot afford it, extension graduates are unable to find solutions to the problem.

The trend at tertiary institutions has been for students from other disciplines to enroll for the extension courses, such as communication and facilitation, because they understand their importance.

It was recommended that it would be advisable for the curricula to be structured to allow students to first complete their basic scientific agricultural training and then move on to extension skills training. They often become confused when agricultural science and social science are mixed.

Participants mentioned that the topics included in the Global Forum for Rural Advisory Services New Extensionist Learning Kit (NELK) incorporated into the University of the Free State's extension curriculum are important and relevant. The New Extensionist Learning Kit includes modules on risk management, adult education, value chains, program management, facilitation, and professional ethics (https://www.g-fras.org/en/knowledge/new-extensionist-learning-kit- nelk.html). Some of these topics are also included in the honors extension curriculum of the University of Pretoria.

4.8.2 Stumbling blocks in AEAS training

Question 3 : *What changes or modifications might you recommend with respect to agricultural extension curricula? Are there courses that are not taught that should be considered to be included in the curriculum? What courses or contents do you consider as outdated that should perhaps be dropped?*

During discussions, participants were of the opinion that the curriculum they have knowledge about is adequate and that the contents need to be updated continually. This could mainly be attributed to the fact that two of the tertiary institution participants were from the University of the Free State that, as mentioned, incorporated the NELK into their curriculum.

Other participants mentioned that there is a dire need for soft skills training such as critical thinking and adaptability in the curriculum. Students should be taught how to prepare for and adapt to unfamiliar circumstances, which are so often experienced in agriculture. They also mentioned that a three-year qualification does not allow enough time to provide in-depth training in the required knowledge; it allows students to only touch the surface of the various topics.

It was further contributed that collaboration with commodity associations can assist in providing practical experience and refresher courses to students. Commercial farmers are often hesitant to provide opportunities for students to gain practical experience because they do not have the time to accommodate them. They also mentioned that the NELK topics taught by the University of the Free State are essential and applicable to current extension needs.

One of the participants who sent his answers via email commented that soil science and the knowledge of soil-water relationships (dryland or irrigation) are essential topics that must be studied properly because of their importance in crop cultivation. Students should also complete a basic course in agricultural economics to successfully assist farmers with financial planning on the farm.

The other individual participating via email said that he would like to see a link to industry for practical training. He mentioned linking students with radio, television, and print media in the communication module as an example.

Question 4 : *How effective are South African extension and advisory services in addressing challenges in the agricultural system? What is one thing that extension and advisory services are doing particularly well?*

In response to these questions, the majority of focus group participants said that the challenges experienced in the AEAS environment in South Africa are often unique. Many public- sector extension workers become fund managers. Selected farmers who are beneficiaries of farming grants are only interested in the next funding opportunity, often used by politicians to manipulate support. In South Africa, the word “beneficiaries” is commonly used in public-sector projects because people are selected to benefit from some form of grant to initiate and support an agricultural project.

It was mentioned by participants that extension officers often become demotivated to improve their skill set because they hardly ever use it. Farmers will regularly speak with high regard of an extension officer only if he/she is a successful channel of funding to them. Extension staff are also regularly burdened with providing transport to beneficiaries from the rural areas to the nearest town/city and back, which discourages the officers from visiting their projects.

Very often, AEAS are efficient in assisting farmers in dealing with production issues. However, the challenge remains to assist farmers in engaging in value chains rather than merely producing basic supplies for other businesses.

Another challenge mentioned was keeping statistics up to date. The government often requires this because the focus tends to be on statistics such as the number of beneficiaries assisted rather than on success stories and quality of service. The political influence and agenda in public extension services are detrimental to its efficiency. Private sector extension services often have more time available to assist farmers because they do not have to adhere to the same administrative protocols.

Cooperation is needed between private and public extension, small farmers, commercial farmers, and commodity organizations to facilitate the transfer of knowledge, mentorship, and guidance that emerging farmers require.

On the positive side, participants mentioned that extension services link up well with NGOs and the private sector in some areas. The Western Cape Department of Agriculture was mentioned by all three groups as being competent and efficient. When asked why participants thought this was the case in the Western Cape, they replied it is due to more efficient and responsible management than in other provinces. The "smartpen" used in the Western Cape by public extension staff enables swift completion of the required administrative tasks while visiting farmers in the field and spending more time focusing on practical issues. When asked why the smartpen is not used by other provinces, the participants replied that it has been offered to all of the provinces, but the Western Cape was the only one that implemented the system.

An organization that was singled out as a good example of providing quality extension services to farmers is the National Wool Growers Association. According to participants, extension staff members there were highly motivated, eager to assist, and knowledgeable.

The Land Care program of the Western Cape was also mentioned as a well-functioning program that can be used as an example of effective extension. Their specialists are knowledgeable on everything related to soil, water, drainage, and caring for land.

The participatory approach of the Department of Agriculture in Limpopo was mentioned as very effective. The graduate placement program of the Department of Agriculture in Limpopo has also worked well.

4.8.3 The way forward

Question 5 : *If you could come up with one major recommendation to improve agricultural extension and advisory services in South Africa, what would it be?*

Answers to this question included support for extension workers by their employers. They must be furnished with updated equipment and the necessary resources to do their jobs.

They must be kept motivated and eager to learn. A participant said: *"Success comes with excitement, and excitement comes with success."*

Closer cooperation between universities/training institutions is needed to communicate relevant skills and competencies on a regular basis through short courses. This will help institutions to build on the positive, explore the success stories, visit them, and learn from them. Better collaboration is also needed between private and public extension services. Private extension services are often better resourced and more up to date because of private funding. Public extension can learn from this. The focus must be on quality service and not statistics/quantity.

Question 6: *Do you have suggestions for others we should be including as we continue to seek inputs and advice?*

Participants agreed that it is important to include the recipients of extension services, the farmers, when discussing the efficiency of AEAS in South Africa. How are they experiencing the competencies of extension workers?

"Extension work should aim to develop the farmer, who in this educational process is empowered to develop his or her farm. The cornerstone of extension work is a scientifically based extension program, jointly developed with relevant stakeholders."

4.9 Discussion

4.9.1 Evaluating available curricula

Below are the available undergraduate curricula in agricultural extension at higher education institutions across the country. For evaluation purposes, the observed skills and competencies are color- coded.

	Program planning
	Program implementation
	Communication
	ICT technologies
	Program monitoring and evaluation
	Personal and professional skills
	Diversity and gender skills
	Marketing, brokering, and value chain development
	Soft skills
	Health and nutrition and sanitation
	Technical subject matter expertise

Table 4.19 : Contents of B.Agric degree in Agricultural Extension at the University of Kwazulu- Natal

UNIVERSITY OF KWAZULU-NATAL – B.(AGRIC) IN AGRICULTURAL EXTENSION	
Prescribed curricula	**Skill/competency**
Farming Systems: Farming systems; types of crops and animals; basic requirements for crop or animal system; terminology and recording; stages in production cycle of crops and animals; productivity and profitability of crop or animal production; production records.	Technical subject matter expertise
Agricultural Production: Physiology of plants and animals; basic management principles of basic crop and animal production systems; plant and animal health; feeding systems available for livestock production.	Technical subject matter expertise
Rural Wealth Creation: The nature of wealth and poverty; sustainable livelihoods assets framework for identifying opportunities and projects for development; project planning.	Program planning
Farm Infrastructure and Machinery: Farm infrastructure; farm machinery and equipment.	Technical subject matter expertise
Natural Resource Identification: Natural resource terminology; bioresource units and bioresource groups; climate; soil erosion; water sources and use; stock watering; soil physical properties; soil water; vegetation dynamics; land units; veld condition assessments.	Technical subject matter expertise

Rural Economic Systems: Basic concepts in farm economics and integrated rural development; sustainability planning/assessment using a sustainability model; analysis of farm/enterprise systems in the context of the rural community.	Program planning	Technical subject matter expertise	
Production Economics and Marketing: Production economic principles; marketing; market supply and demand.	Marketing, brokering, and value chain development	Technical subject matter expertise	
Impact on Natural Resources: Soil chemical properties; soil fertility; vegetation cover; erosion and its control; gully reclamation; classification and structure of vegetation; vegetation encroachment.	Technical subject matter expertise		
Forage Livestock Production: Veld management; pasture selection and management; grazing and grazing systems; conserved feeds; stock and fodder flow planning; management of grazing livestock.	Technical subject matter expertise		
Plant Propagation: The industry; propagation environment; breeding systems; sexual propagation and vegetative propagation; cell tissue culture propagation.	Technical subject matter expertise		
Extension Methods: Perspective, values, and attitudes in rural development; theory of adult learning and experiential learning; introduction to farming systems; participatory approaches to extension: PLA, PTD, Farmer to Farmer; policies impacting extension and rural development; application of farming systems analysis in the field.	Program implementation	Communication	Technical subject matter expertise

Extension Practice: Group dynamics and team contracts; facilitation and presentation skills; active communication strategies; application of participatory techniques.	Program implementation	Communication	Soft skills	
Field Crop Production: The industry; data used in managing crop enterprises; crop growing systems; plant and growth characteristics; environmental factors; establishing crops; manipulation of environment; sustainable production economics; harvesting, packaging, and marketing products.	Technical subject matter expertise			
Intensive Livestock Production: The livestock industry; breeding and selection; management principles and practices; reproduction; feeding and nutrition; growth and development; product quality; value adding; records; economics of production.	Technical subject matter expertise			
Farm Business Management: Agricultural business and management principles; financial and physical production records; financial statements; budgets.	Marketing, brokering, and value chain development	Technical expertise	subject	matter
Farm Development: Soil classification; land capability; land use planning; conservation planning; surveying.	Technical subject matter expertise			
Farm finance: Farm business management principles; marketing, market demand, and supply; financial statements; budgets; farm finance.	Marketing, brokering, and value chain development	Technical expertise	subject	matter
Designing Extension Projects: Sustainable livelihoods approach; participatory project planning; developing and applying a theoretical framework for research/ policy critique.	Program planning	Program implementation	Program monitoring and evaluation	

Participatory Extension: Learning models; group dynamics; participatory development methods and application as part of rural development interventions; the community development cycle and process in rural communities; expectations of community development practitioners in a rural socio- agriculture context.	Program planning	Program implementation
Extension Placement: Learning models; group dynamics; sustainable livelihoods approach; participatory project planning; application of extension theory.	Program planning	Program implementation
Land Preparation: Soil classification; land capability; land use planning; conservation planning; surveying in the context of land preparation.	Technical subject matter expertise	
Land Use Planning: Application of land use planning and general agricultural principles.	Technical subject matter expertise	
Basic IsiZulu Language Studies	Technical subject matter expertise	

Source: (UKZN, 2022)

Strengths: Good technical subject matter contents. Program planning and implementation. Agricultural economics included.

Weaknesses: Lacks comprehensive communication skills and competencies, and marketing, brokering, and value chain development skills and competencies. Contents not included: ICT skills and competencies, personal and professional development skills and competencies, program monitoring and evaluation skills and competencies, diversity and gender skills and competencies, soft skills, and nutrition skills.

Table 4. 20: Contents of B.Agric degree in Agricultural Extension at the University of Fort Hare

UNIVERSITY OF FORT HARE – B.(AGRIC) IN AGRICULTURAL EXTENSION	
Prescribed curricula	**Skill/competency**
Basic Chemistry: Basic concepts of matter; gases; chemical arithmetic; chemical analysis; thermochemistry; atomic structure; chemical bonding; solution chemistry; acid-base equilibria; redox equilibria.	Technical subject matter expertise
Biology: Architectural patterns of animals; animal classification; review of invertebrate and vertebrate groups; aspects of animal biology.	Technical subject matter expertise
Introduction to scientific concepts: Basic and derived isometric units; multiples and submultiples; computations using a scientific pocket calculator, indices, scientific notation and standard form; significant figures, decimal places, rounding off and rough checks; mensuration; scientific concepts and related formulae; averages, ratios and proportion, percentages, percentage error, and percentage change; logarithms; elements of geometry and trigonometry.	Technical subject matter expertise
Elements of Agro Meteorology: Climatic surveys and their application in land use planning; management practices for alleviating specific climatic limitations; the installation, operation, and interpretation of data from the following meteorological equipment: rain gauge, max and min. thermometer, wet and dry bulb psychrometer, class A pan, thermo-hygrograph; the compilation and interpretation of an elementary water budget for maize, given Class A pan data, crop factors, water- holding capacity of the soil, and depth of root penetration with time.	Technical subject matter expertise

Introduction to Crop Science: Plant and animal gametogenesis and life cycles; Mendelian principles of inheritance; gene interactions; sex determination and sex linkage; nucleic acids, the genetic code and protein synthesis; origin, classification, and nomenclature of economic crops; germination and seed quality; vegetative growth; root growth; flowering and seed formation; photoperiodism. Practicals involving identification of seeds of agronomic crops grown in South Africa; identification of crop plants: cereals, legumes, and other families of agronomic importance; seed and seedling development: germination (types, percent); asexual propagation.	Technical subject matter expertise	
Intro to Computers and Computing Theory: Theory: uses of computers; components of a computer-- processor, memory, input devices, output devices; theoretical aspects of word processors, spreadsheets, databases, and presentations; computer networks and the Internet; an introduction to basic HTML. Practical: Use of the operating system, the file management system, word processing, spreadsheets, presentations, databases, and the World Wide Web and electronic mail.	ICT competencies and skills	
Life, Knowledge, Action: The thematic areas include collective futures; democracy, diversity, and identity; science, technology, environment, and society; poverty, inequality, and development.	Personal and professional skills	
Introduction to Agricultural Economics: Introduction to economic concepts; production factors; the functions of the economy; The role of prices and money in the economy; structure of the economy; agriculture in the economy; introduction to agricultural production economic theory; the production function, cost functions, input and output optimization.	Technical subject matter expertise	
Marketing of Agricultural Products: The marketing problem; analyzing agricultural markets; agricultural production characteristics and marketing; food consumption and marketing; agricultural price formation and price discovery; cost of marketing; marketing institutions and the Marketing Act; cooperatives; marketing and agricultural development.	Marketing, brokering, and value chain development;	Technical subject matter expertise

Introduction to Seminar Writing: Scientific literature and its use; science writing; methods of seminar preparation and presentation.	Technical subject matter expertise
Farm Management: The decision- making process; record keeping for farm management information; gross margin budgets for individual crop and livestock enterprises and their analysis; partial budgeting; techniques for analyzing the whole farm; planning the farm using budgeting and program planning; estimating fixed costs; uncertainty and farm planning; control of the farm business.	Technical subject matter expertise
Introduction to Soil Science: The origin of soils; types of parent materials; mineral and rock types; geological formations of South Africa; rock weathering; soil formation and classification: the soil profile, horizons, nomenclature; factors of soil formation; classical soil types -- e.g., podzol, latosol, chernozem; SA soil classification, most important soil series; physical properties of soils: texture, structure, moisture properties, soil air, soil temperature, soil color; chemical properties of soils: chemical composition, clay minerals, cation exchange, pH, soil acidity, liming, brack soils; biological properties of soils: organisms, organic matter, ammonification and nitrification; soil fertility and fertilizers: fertility indicators, types and sources of N, P, K fertilizers, fertilizer mixtures, principles of fertilizer recommendation.	Technical subject matter expertise
Introduction to Pasture Ecology: Grass taxonomy; grass morphology; practical plant ecology; veld burning; effect of grazing animals on veld.	Technical subject matter expertise
Veld and Cultivated Pasture Management: Pasture terminology; practical principles of pasture management; grazing practices and systems; formulation of veld management systems; veld rehabilitation; establishment and management of cultivated pastures; formulation of a cultivated pasture system.	Technical subject matter expertise
Pedology: Nomenclature; soil genesis: factors of soil formation, geomorphology, and the accumulation of parent material, process of soil formation, horizon differentiation; soil classification: some classical systems, S.A. system in some detail; soil mapping, aerial photographs, land capability/soil suitability assessment.	Technical subject matter expertise

Introduction to Animal Science: Introduction to animal husbandry and livestock industry in southern Africa; types and breeds of farm livestock; evolution, origin, characteristics and usefulness; regionalization of livestock production, nutritional aspect, maintenance, production energy and other requirements, roughage, sweet- and sourveld; fresh milk; beef, sheep, pig, and poultry regionalization; terminology definitions used in describing animals; environment and adaptability; basic principles of animal production; reproduction, bone growth, development and growth, compensatory growth, and milk secretion; production and management practices of dairying, beef, pigs, horses, sheep, and goats.	Technical subject matter expertise		
Principles of Crop Production: Importance of crop plants in human welfare and the SA economy; cropping systems in SA; objectives of crop production; tillage principles; principles of crop rotation; quality in crop products; fertilizers and fertilizing; organic production; conservation agriculture; green revolution. Practicals include laboratory calculations of nutrient content of fertilizers; review of research findings; field demonstration of tillage equipment, rotations, and conservation agriculture practices.	Technical subject matter expertise		
Introduction to Agricultural Extension: Part (a) -- Communication: Communication, its objectives, and an analysis of the process; the theory and use of mass media, group media, interpersonal communication, production and use of audiovisual aids, public speaking, conducting meetings, demonstrations and farmer's days; choice of topic and level of audience, prepared and unprepared speech, introduction to language, writing, meaning and scope of technical writing and reporting, style, and presentation; the adoption and diffusion process – communication for change (one lecture per week). Part (b) -- Principles of Extension: The objectives, principles, and philosophy of extension and rural development. Agricultural extension services: operation, functions, and role in agriculture and rural development, with particular reference to the developing areas of southern Africa; historical background of the development of extension services and present organizational structure, scope of work, long- and short-term objectives, and problems in relation to the basic principles and philosophy of extension education; the role, duties, and responsibilities of extension educators.	Communication	Program planning	Program implementation

Elementary Animal Health: Practical calculations and services in connection with dips, worm drugs, and vaccines; an understanding of applied animal health practices -- e.g., dosing, injecting, castrating, blood sampling, etc.; the recognition and treatment of important livestock diseases and plant poisoning; understanding the meaning and importance of hygiene.	Technical subject matter expertise
Practical Agricultural Experience: Practical, hands-on experience of on-farm activities for all third-year agricultural students to enable them to apply their theoretical knowledge practically.	Technical subject matter expertise
Plant Pest Control: General introduction to crop protection: definition of terms used in crop protection, identification of major groups of agricultural pests and introduction to crop protection methods; weed science: definition of weeds and weed characteristics, classification of weeds, importance of weeds in agriculture (losses and beneficial effects), weed reproduction, weed ecology, methods for weed management and control; entomology: importance of insects, general classification and anatomy of insects, life cycles of insects, diet and feeding, insect ecology, reproduction, insect pest control and management; plant pathology: overview of the causes of plant diseases, classification of plant diseases, plant disease diagnosis, pathogen survival and dispersal mechanisms, describing the infection processes, effects of plant pathogens on crop physiological processes, control of plant pathogens.	Technical subject matter expertise
Agronomy of Summer Crops: The morphology, physiology, and management practices of maize, sorghum, pearl millet, groundnut, soybean, sunflower, bean, potato, cowpea, pigeon pea.	Technical subject matter expertise
Land Use Planning: Introduction: motivation, constraints, influence of economic factors; basic concepts regarding ecosystems of different agricultural potential; collection of physical data: climate, erosion vegetation, soil, topography, water resources, present land use, and social and economic conditions; economic considerations; integration of physical data and evaluation of potential; planning, consideration of the following aspects: economics, soil conservation, irrigation, pastures, horticulture, animals, crops, social factors; farming systems and change in agriculture.	Technical subject matter expertise
Small Stock Production: Regionalization of various important sheep and goat breeds – their adaptability, production, reproduction, and growth; histological development of wool and mohair fibers, main physical characteristics, handling and marketing of wool and mohair.	Technical subject matter expertise

Vegetable and Herb Production: Brief survey of the vegetable industry in southern Africa; economic and importance and food value of vegetable crops; classification of vegetable crops; climate and soil as factors in vegetable growing; seeds, production, seed certification and testing; seedbed preparation, sowing, and transplanting; raising of seedlings in cavity trays; nutrient requirements of vegetable crops: types of nutrients and fertilizer application; management of vegetable crops in different growing systems: open-field and greenhouse growing systems and hydroponic techniques; vegetable and herb harvesting, storage, and marketing process; economic importance, nutritional value, production areas, climatic requirements, and other selected aspects of the major vegetable crops.	Technical subject matter expertise

Agricultural Extension and Rural Development: The human problems experienced in extension and rural development, including aspects of rural sociology, group dynamics, leadership development and adult education. Part (a) -- Rural Sociology and Cultural Anthropology. Analysis of human society and the individual as a member of the family, the community, and other social systems; rural sociology and cultural anthropology and its importance; the farmer in his social environment; cultural patterns as a basis for social behavior and change, group relations; kinds of groups and their importance; social structure and its implications for social change; kinship structures; power and community decision- making process; migration and urbanization and its effect on rural communities; local and world religions; characteristics of peasant societies; attitudes and attitude change. Part (b) -- Adult Education and Extension Teaching Methods. The meaning, scope, and importance of adult education in southern Africa. Planning adult education; the adult learner and learning; some principles of promoting effective learning; methods and techniques of teaching adults effectively; evaluation of extension teaching methods. Part (c)-- Group Dynamics and Leadership. Analysis of human group processes as part of society and as a social process; group formation and function in society and cultural change; leadership development and role in agricultural and rural development; identification of leaders; role of groups and group leadership in formal and non-formal educational development. Practical work: Study of group dynamics – functioning and evaluation of groups.	Program implementation	Soft skills	Technical subject matter expertise

Applied Extension and Rural Development: Part (a) -- Extension and Rural Development Programming and Evaluation. The need for extension and rural development plans; objectives and philosophy, planning and procedures in extension and rural development planning at national, regional, district, and area levels. Practical work: Planning of an agricultural extension and rural development program. Part (b) -- Extension Research and Evaluation. A general study of types of extension and education research; principles of research design; methods of data collection in agricultural extension, rural development, and related fields; a detailed study of the research and evaluation process; evaluation and monitoring of development projects. Part (c) -- Management of Agricultural Extension and Rural Development. The management of agricultural extension and rural development organizations; setting organizational objectives; criteria for efficiency; organizational structures; job specifications; motivational theories; training.	Program planning	Program implementation	Program monitoring and evaluation
Seminar in Agricultural Extension: learners Understanding the human problems experienced in extension and rural development, including aspects of rural sociology, group dynamics, leadership development, and adult education, and the skills to apply this knowledge in practice.	Program implementation	Program monitoring and evaluation	
Project in Land Use Planning: The determination and description of the agricultural land and the present system of land use; the formulation of a proposed system of land use covering all aspects of agriculture pertaining to the particular land unit; the compilation of maps showing the present and proposed systems of land use.	Technical subject matter expertise		

Source: (UFH, 2022)Strengths: Good technical subject matter content. Program planning and implementation. Program monitoring and evaluation. ICT skills, personal and professional development skills, marketing, brokering, and value chain development skills and competencies.

Weaknesses: Excessive elementary technical subject matter content. Lacks comprehensive communication skills and competencies content as well as ICT skills. Contents not included: diversity and gender skills and competencies, soft skills, and nutrition skills.

Table 4. 21: Contents of B.Agric degree in agricultural extension at the University of the Free State

UNIVERSITY OF THE FREE STATE – B.(AGRIC) IN AGRICULTURAL EXTENSION	
Prescribed curricula	Skill/competency
Microbiological Principles in Agriculture: Students who successfully complete this module will be qualified to describe the basic characteristics and importance of micro-organisms, with specific reference to their role in agriculture. This knowledge is based on the introductory cell structure, taxonomy, nutrition, microbial physiology, interaction between microorganisms and plants or animals, the production of high-quality food products, as well as the factors that corrupt food. Practical work: Students that complete the practical part successfully will be equipped to conduct basic microbiological investigations relevant to the agricultural sector.	Technical subject matter expertise
Mathematical and Biometrical Principles in Agriculture: Skills will be developed in mathematical and statistical calculations; the use of algebraic and graphical solutions of problems as applied to linear and quadratic equations; the use of descriptive statistics, with attention to central and dispersion parameters (mean and variance); use and application of ANOVA, regression, and correlation to solve agriculturally related problems. Practical work: Calculations will be done applying the theoretical knowledge in solving agriculturally orientated mathematical and statistical problems.	Technical subject matter expertise
Introduction to Soil, Crop, and Climate Sciences: This module will build on a number of fundamental and applied sciences to introduce the complex and integrated nature of soil, crop, and climate production ecosystems.	Technical subject matter expertise

Introduction to Animal, Wildlife, and Grassland Science: This module includes the following: domestication and migration routes of livestock species, livestock industry, livestock breeds; handling of farm animals; concepts in livestock production; livestock and the environment; safety in livestock production; wildlife species and production systems; vegetation of South Africa and the grassland ecosystem; career opportunities in the animal, wildlife, and grassland science industries. Practical work: Visits to different production systems; demonstrations of animal handling in different specie; grassland evaluation techniques; identification of wildlife and vegetation species.	Technical subject matter expertise
Biological Principles in Agriculture: After completion, students will be able to apply the principles of the physiology of farm animals and agricultural and horticultural crops within disciplines. The body systems of the animal, inherent physiological differences in plants, establishment and vegetative and reproductive growth, and the surveying, transport, and working of fertilizers, water, and pesticides. Practical work: Demonstrations of the principles involved in the body. The most important theoretical aspects of crops are practically conducted	Technical subject matter expertise
Chemical Principles in Agriculture: Simple chemical principles, concepts, processes, and calculations that are important in agriculture sciences, especially with respect to soils, plants, animals, and food. Practical work: Students will acquire laboratory skills, which will be used to do simple chemical experiments related to soils, plants, animals, and food, and submit reports of these experiments for evaluation.	Technical subject matter expertise
Physical and Mechanized Principles in Agriculture: The basic physical concepts in mechanics, hydrodynamics and hydrostatics, electricity, energy, and the application of the gas laws in agriculture and agricultural sciences, and their application to influence the behavior of animals, plants, and natural resources. Students will be familiar with the International System of Units and unit conversion. Practical work: Performing laboratory experiments and calculations that illustrate some of the key concepts.	Technical subject matter expertise

Introduction to Agricultural Economics: The role of resources in the agricultural economy, supply and demand of agricultural products, marketing and the determination of price, farm management and financial principles; the current agricultural, trade, and development policies in South Africa.	Marketing, brokering, and value chain development	Technical subject matter expertise
Computer Literacy: Basic knowledge of the principles of microcomputers and microcomputer hardware, the basic commands of the operating system, a general word processing program, a spreadsheet program, presentation program, and the Internet and its applications.	ICT skills	
Extension Within the Agricultural Innovation System: Detailed knowledge of the agricultural extension disciplines and/or practices, including an understanding of and an ability to apply the key terms, concepts, facts, principles, rules, and paradigms of this field, discipline, or practice; knowledge of the agricultural extension discipline related to Rural Advisory Services and Agricultural Innovation Systems discourse and other fields, disciplines, or practices.	Technical subject matter expertise	Program planning
Concepts in Crop Production	Technical subject matter expertise	
Introduction to Ruminant Production: General principles of beef, dairy, sheep, and goat production; the role of the four industries in South Africa; various breeds; the effect of nutrition, breeding, physiology, and health on the efficient production of beef, mutton (lamb meat), milk, and wool.	Technical subject matter expertise	
Soil Science	Technical subject matter expertise	
Grassland Ecology	Technical subject matter expertise	
Communication for Innovation: Detailed knowledge of the Communication for Innovation disciplines and/or practices, including an understanding of and an ability to apply the key terms, concepts, facts, principles, rules, and paradigms of this field, discipline, or practice; knowledge of how communication for innovation relates to extension, rural advisory services, and agricultural innovation systems discourse, and other related fields, disciplines, or practices	Communication	

Sustainable Soil and Water Management	Technical subject matter expertise	
Introductory Monogastric Production: The general principles of pig, poultry, and ratite production; the role of the different industries in South Africa; various breeds; the effect of nutrition, breeding, physiology, and health on the efficient production of meat, eggs, and leather products.	Technical subject matter expertise	
Game and Natural Environment Interaction: The interaction between game and their environment, with emphasis on their habitat and food selection in the natural veld, competition for it, and seasonal changes in the environment; the role that the wild animal's environment plays in its reproduction, herd size, migration, conflict with humans, etc.: general principles on ecology, availability and utilization of food by game in natural veld (extensive system), and basic methods of veld surveys and carrying capacity.	Technical subject matter expertise	
Facilitation for Development: Introduction to the basic principles of facilitation and what it means within the Agricultural Innovation Systems context. The course will enhance students' capacity to translate conceptual ideas into actual intervention practice.	Program implementation	Communication
Extension Program Management: Tools for creating a vision for effective extension programs and the important elements in the program planning cycle. Using the tools -- such as results- based planning, logical framework, theory of change, and impact pathways-- exposes students to integrated and systemic planning processes.	Program planning	Program implementation
Community Mobilization and Local Organizational Development: Concepts and principles of community mobilization and local organizational development and how they relate to agricultural development, with emphasis on understanding the concepts required and the skills that are needed to be able to mobilize communities, developing local organizational capacities, and promoting equitable participation in agricultural innovation processes.	Program implementation	Program monitoring and evaluation

Management of Change and Adaptation: How change acts upon people and what leadership behaviors are needed to manage it effectively. Using various models, the student will learn key skills for overcoming resistance to change, for supporting oneself and others in times of uncertainty, for facilitating the transition process, and for linking these skills to the climate change adaptation discourse.	Program implementation	Technical subject matter expertise
Agricultural Entrepreneurship and Value Chains: The concept of entrepreneurship in the context of agricultural development -- the principles, qualities, and competencies required, and how this links to the value chain discourse.	Marketing, brokering, and value chain development	
Adult Learning, Behavioral change, and Gender: The concepts of adult learning, behavioral changes, and gender, and how they relate to the agricultural development, extension, and Agricultural Innovation Systems.	Diversity and gender skills	Technical subject matter expertise
Cattle Production Systems: Integrated management aspects related to nutrition, breeding, products, ecology, animal diseases, husbandry, and economy; how nutrition, breeding, products, ecology, animal diseases, husbandry, and economy can be manipulated within various production systems to increase efficiency of production in sheep, dairy, and beef enterprises.	Technical subject matter expertise	
Winter Grain, Industrial Diverse and Diverse Crops: Cultivation practices for the most important winter grain, industrial, and diverse crops of South Africa, and application of the theoretical and practical aspects of soil tillage, seedbed preparation, planting techniques, plant nutrition, pest control, harvesting, and grading to these crops. Practical sessions: detailed study of the morphology of these crops and development and practice of crop cultivation skills.	Technical subject matter expertise	

Soil Classification: Classification of South African soils; the behavior and function of these soils under natural, agricultural, and urban ecosystems; application of soil surveys for land use planning,	Technical subject matter expertise
Sheep and Goat Production Systems: Integrated management aspects related to nutrition, breeding, products, ecology, animal diseases, husbandry, and economy; and how those can be manipulated within various production systems to increase efficiency of production in sheep, dairy, and beef enterprises.	Technical subject matter expertise

Source: (UFS, 2022)

Strengths : Good technical subject matter content. Program planning and implementation. Program monitoring and evaluation. ICT skills, personal and professional development skills, marketing, brokering, and value chain development skills and competencies, diversity and gender skills.

Weaknesses : Contents not included: soft skills and nutrition skills. Lacks sufficient ICT skills.

Table 4.22 : Contents of B.Agric degree in Agricultural Extension and Rural Resource Management at the University of Mpumalanga

UNIVERSITY OF MPUMALANGA – B.(AGRIC) IN AGRICULTURAL EXTENSION & RURAL RESOURCE MANAGEMENT *Course contents were not available for the modules.*	
Prescribed curricula	**Skill/competency**
Plant Protection	Technical subject matter expertise
Rural Wealth Creation	Program planning
Introduction to Farm Management	Technical subject matter expertise
Agricultural Engineering	Technical subject matter expertise
Introduction to Soil Science	Technical subject matter expertise
Computer Application for Extension	ICT skills
Plant Propagation	Technical subject matter expertise
Rural Economic Systems	Program planning
Agricultural Mechanization	Technical subject matter expertise
Scientific Writing and Reporting	Technical subject matter expertise
Soil Science	Technical subject matter expertise
Introduction to Vegetable Production	Technical subject matter expertise
Introduction to Agronomy	Technical subject matter expertise

Introduction to Fruit Crop Production	Technical subject matter expertise	
Extension Methods	Program implementation	Communication
Budget and Risk Management	Technical subject matter expertise	
Introduction to Irrigation	Technical subject matter expertise	
Designing Agricultural Extension Projects	Program planning	
Developing a Farm Business Plan	Technical subject matter expertise	
Developing a Land Use Plan	Technical subject matter expertise	
Participatory Agricultural Extension	Program implementation	
Extension Placement	Program monitoring and evaluation	

Source: (UMP, 2022)

Strengths : Program planning and implementation. Program monitoring and evaluation, diversity and gender skills.

Weaknesses : Content not included: Marketing, brokering, and value chain development, diversity and gender skills and competencies, soft skills, and nutrition skills.

Table 4.23 : Contents of diploma in Agricultural Community Extension at the Mangosuthu University of Technology

MANGOSUTHU UNIVERSITY OF TECHNOLOGY – DIPLOMA IN AGRICULTURAL COMMUNITY EXTENSION Module content was not available	
Agricultural Extension	Extension subject matter
Basic English	Technical subject matter expertise
Basic Science	Technical subject matter expertise
Health and Hygiene	Technical subject matter; nutrition
Human Ecology	Technical subject matter expertise
Computer Skills	ICT skills
Basic Food	Technical subject matter expertise
Basic Skills	
Extension	Extension subject matter
Land Use Planning	Technical subject matter expertise
Basic Nutrition	Nutrition

Source: (MUT, 2022)

Strengths: Includes nutrition skills and competencies.

Weaknesses: Very basic with little agricultural content.

Table 4. 24: Contents of Agricultural Extension course available at the International Agricultural Academy for Africa

INTERNATIONAL AGRICULTURAL ACADEMY FOR AFRICA			
Module 1: Induction course: Agripedia	Technical subject matter expertise		
Module 2: The Mental Approach to Agricultural Extension: Determining the current reality Establishing the foundation – how your experience is created A new understanding of the mind: implications, not applications Applying the approach in practice	Program planning		
Module 3: Communication in Extension: Communication process and principles Verbal and non-verbal communication Written communication Managing a communication project Negotiation technique	Communication		
Module 4: Groups and Group Dynamics: Introduction to working with groups Advantages and disadvantages of groups Group goals, aims, and objectives Conflict of interest Group techniques Leadership and leadership development Techniques for community interaction	Program implementation		
Module 5: Agricultural Extension as a Profession: Research methodology and writing of academic content The principles of agricultural extension and the role of information and knowledge	Program monitoring and evaluation		
Module 6: Extension Projects and Programs: What is project planning? The effect of appropriate or inappropriate choice of plans Why project planning? The principles of project planning The purpose and meaning of project planning The procedures of project planning The importance of people's needs Project management Aftercare support, evaluation. and outphasing Local economic development programs (LEDs) Provide a business advisory service	Program planning	Program implementation	Program monitoring and evaluation

Module 7: The Approach to Community Development: The survey (research and gathering of information) The questionnaire Case studies Proposed strategies for development Extension staff duties, procedures, management and supervision, records, etc. Factors limiting production Institutions, cooperatives, and marketing facilities	Program monitoring and evaluation	
Module 8: Evaluation in Extension: The nature and place of evaluation The evaluation processes The uses of evaluation results Conclusion and appendices	Program monitoring and evaluation	
Module 9: The Extension Officer as Educational Practitioner Effective classroom management The use of values, vision, dreams, mission, and purpose Communicating a message Presentation Effective listening as a skill Self-assessment and evaluation The practitioner's footprint The classroom environment Motivation Learning models Evaluation International training	Personal and professional skills	Communication

Module 10: Community Disaster Risk Management What is community resilience? Self-efficacy Outcome expectancy Critical awareness Action coping Community participation Articulating problems Empowerment Trust Resources Where do communication and messaging fit within all this? Being a policy and program entrepreneur Appendices: Resilience measurement template	Technical subject matter expertise	Personal and professional skills	Communication

Module 11: Commercial Farm Planning Objectives of farm planning The landscape Legal requirements and finance Land capability classification Inventories Compiling the farm plan	Technical subject matter expertise

Source: (I3A, 2022)

Strengths: Thorough extension competencies and skills content.

Weaknesses: Little technical subject matter content. It will work well as an added qualification for qualified agriculturists.

It is clear that in most of the undergraduate qualifications, with the exception of the one offered by the International Agricultural Academy for Africa (i3A), there is an abundance of technical subject matter. It should be noted that the qualification offered by i3A is a one-year program after which a certificate is issued, not a degree. The admission requirements for the national certificate are one of the following:

- A national certificate or national diploma in any agricultural field on an NQF 5 level.
- Completion of the first year of study in a bachelor of agriculture or bachelor of science in agriculture degree program.
- A national diploma in agricultural management, a technical diploma, or a bachelor of technology in agriculture degree.

CHAPTER 5 : CONCLUSIONS AND IMPLICATIONS FOR POLICY

The essential objective of this study was to identify process skills and competency gaps in the available undergraduate agricultural extension curriculum in South Africa. The study was conducted both qualitatively, using focus group discussions, and quantitatively, using a questionnaire to collect data. The questionnaire results revealed that the respondents considered all the skills and competencies listed in the questionnaire important. Those familiar with the various available curricula indicated that most skills and competencies listed are only moderately covered.

The participants of the focus group discussions were of the opinion that extension workers in South Africa lacked the critical skills to perform their responsibilities efficiently. Skills singled out were required specialized technical skills, facilitation and communication skills, soft skills such as critical thinking and problem solving, and business management and marketing skills. Ensuring that these skills and competencies are included in all South African teaching institutions' curricula is vital for agricultural development in the country.

The national policy on extension and advisory services (DAFF, 2016) lists several requisites of effective agricultural extension and advisory services (AEAS). These include building the capacity of producers in marketing, farm productivity, and financing. Enabling farmers to deal with climate change and practice sustainable farming methods is also on the agenda. This must be done while networking among the various role players in the sector and facilitating interaction among them to initiate and sustain change.

The most recent draft review of the national framework for the minimum norms and standards for extension and advisory services in agriculture stipulates that tertiary training institutes that offer agricultural extension training should review their curricula regularly to effectively train and support AEAS to be able to function in the current agricultural environment (DALRRD, 2020).

Extension staff members must be appointed according to their individual skill sets. For example, an extension officer with substantial sheep production experience should be allocated to an area with predominantly sheep farmers.

5.1 Findings and recommendations

5.1.1 Keep curricula relevant and updated

It is vital for each institution offering agricultural extension training to keep the curriculum relevant to meet the profession's requirements. There is a need for participatory curriculum development (PCD) in AEAS to ensure that students are trained appropriately for the demands of their profession. The relevant stakeholders include training institutions, government, appropriate private- sector role players, and farmers. This complex process can be cumbersome to the curriculum development procedure and requires specialized expertise (Stabback, 2016, pg.3):

"Inclusive and consultative curriculum development processes will help in finding appropriate balances among a range of stakeholder aims that sometimes, but not always, compete: individual aims versus social ends; academic versus vocational aims; economic versus democratic purposes; social conservatism and continuity versus social reform and change; local versus global priorities."

Regular review of a curriculum by all the stakeholders of the profession is needed to ensure appropriate training of AEAS professionals to equip them for the workplace (Easterly et al., 2017). Practical training remains an important component of agricultural education. Education institutions must ensure that they have the facilities to provide students with sufficient exposure to real-life scenarios. If funding is a problem, these institutions must consider forming alliances with private- sector role players (agricultural service providers, farmers) who can assist by providing access to their facilities.

According to a study conducted by Ghimire and Martin (2011) graduate programs are the most suitable for teaching socioeconomic and cultural situational analysis of a community. This will encompass communication skills and gender and diversity skills. The workplace is the best place to learn personal and professional skills and continuing in-service programs is where program monitoring and evaluation skills should be enhanced (Ghimire and Martin, 2011).

The required skills and competencies of public -sector agricultural extensionists are specified in the draft review of the national framework for the minimum norms and standards for extension and advisory services in agriculture (DALRRD, 2020). Referred to as "the ideal curricula mix", they are listed in Table 5.1 below.

Table 5.1 : "The ideal curricula mix"

Concept	Study Field	Areas of essential knowledge/skill and competencies
Communication and interaction (vehicle through which extension takes place)	Communication	Fundamentals of communication Communication strategies Individual/group/mass communication Communication aids Managing the communication process Mentoring (the protégé and the mentor) Individual facilitation process Consultation dialogue Effective knowledge management Identification and use of appropriate ICTs Identification of cultural and gender implications in communication and innovation

	Group facilitation	Group dynamics and theories • Group forming and utilization • Facilitation methods and techniques Leadership development Adult education: Practicing adult learning design and implementing adult learning programs Initiation and support of social networks for agricultural innovation
Extension methodology (implementing and managing the extension process)	Approaches to extension	Various implementation approaches and structures Philosophy of change and development Extension systems History and development of agricultural extension Action research and action learning Extension program planning, implementation, monitoring, and evaluation Problem- solving techniques Forming strategic partnerships, networking, and managing stakeholders Pluralism in extension and the need for and methods of coordination and linkages
	Management in extension	Strategic planning and management Corporate policy and capacity building Organizational and systems theory Functions of management Motivational theory Networking, linkages, and coordination Program development and planning Program implementation and management Evaluation of extension Extension accountability Extension profession quality management systems Ethics and professionalism

Extension philosophy and practice (the science of extension)	Behavioral change	Agricultural production as forms of behavioral influencing factors Behavior fundamentals and theories Behavioral change processes and intervention Adoption and diffusion processes
	Decision making	Basis of behavioral change The decision-making process Influence and function of mediating variables Individual decision making Group decision making Risk, uncertainty, and risk perception Information and knowledge management in judgment and decision making
Contextual Extension (The context or environment of extension practice)	Community development	Rural sociology, structures, and leadership Dynamics of social change Organizational and institutional structures Participation and empowerment Facilitation, negotiation, and conflict resolution Community developing roles Social networking and coordination
	Extension policy making	Natural resource utilization and protection The policy- making process Policy analysis and evaluation Technology transfer and skills development The agricultural/legal environment
		Commercial agricultural production environment Small-scale agricultural production environment
Value chain	Value chain extension	Explaining basic concepts and tools for value chain approaches Linking producers to markets (input and output markets) Analysis of consumer preferences Responding to standards certification and regulatory system

Source: DALLRD, 2020

Comparing the currently available curricula in Chapter 4 to this “ideal curricula mix” makes it clear that many of the qualifications fall short in meeting the profession’s mentioned needs.

This is where a participatory approach involving all the relevant stakeholders can play a pivotal role in ensuring that curricula are continually updated and kept relevant.

Another concern is the content variation between the available qualifications. A student studying extension at one university will have a different skill set than one studying at another, yet the same qualification.

5.1.2 Decide on the best format for qualifications

Based on the analysis done, the following questions have to be asked:

- Should extension be available as a separate undergraduate qualification, or should the process skills and core competencies be included in all the undergraduate agricultural degrees as extension subjects or modules? This would equip a student with any agricultural qualification to become an extensionist should he/she later decide to do so.
- Alternatively, should an extension qualification be offered only as a postgraduate qualification that students can complete full-time or part-time? This would also give employed extensionists access to a specialized qualification.
- Can the profession benefit from a selection process for prospective agricultural extension students? A study conducted by Dlamini (2017) found that, in the particular research population involved, the influence of family and friends and job considerations were the most important influencers on students' choice of agriculture as a study field (Dlamini, 2017). A better understanding of what the career choice entails will increase the student's likelihood of success, and this could assist in ensuring that individuals with the right mindset and attitude enter the profession. This should already start at school level.
- Should a practical year be incorporated into the qualifications? This would be a year in which students are exposed to and work hands-on with everyday agricultural challenges.

5.1.3 The role of the South African Society of Agricultural Extension (SASAE)

Professional bodies play a fundamental role in developing curricula in certain professions in South Africa. For example, many economic and management sciences qualifications have professional bodies that prescribe the curriculum and accredit the degree. The South African Institute of Chartered Accountants (SAICA) prescribes and accredits degrees in the accounting profession. Degrees in marketing and communication management are prescribed and accredited by the Public Relations Institute of South Africa (Dowelani and Dowelani 2020) . As previously mentioned, natural and agricultural science qualifications are regulated by the South African Council for Natural Scientific Professions (SACNASP). Although it plays an advisory role to its members, it is not involved in curriculum development and accreditation. An institution that can

facilitate this collaboration and play a more regulatory role in curriculum development for AEAS is the South African Society of Agricultural Extension (SASAE). More research is needed on this process and its advantages and disadvantages.

Ensuring that AEAS qualifications at the various training institutions address the profession's demands will enhance efficiency in the sector. Collaborating with private-sector role players willing to provide practical training and exposure to students will ensure that students arrive at the workplace already exposed to the environment they will work in.

5.1.4 Emphasizing the focus

Agriculture is a complex, multifaceted field. It is influenced by a vast array of internal and external elements. Expecting an extensionist to be knowledgeable on all these facets and details is a tall order and unfeasible.

The Department of Agriculture, Land Affairs, Rural Development and Land Reform has proposed a hierarchy of available agricultural expertise in the most recent review on the minimum norms and standards for extension and advisory services in agriculture (DALRRD, 2020). They are:

Suggested titles	**Educational qualifications and experience (minimum requirements)**
Agricultural advisor	Four-year qualification in agriculture (at NQF level 8)
Senior agricultural advisor	Four-year qualification in agriculture (at NQF level 8) plus 3 years' experience
Specialist agricultural advisor	Master's degree in agriculture plus 6 years' experience

The proposed ratio of employment of these positions is 1:3:1. In other words, for every agricultural advisor employed, there should be three senior advisors and one specialist agricultural advisor employed. Effective implementation of the above proposal would ensure better access to technical expertise in public service agricultural extension. A junior advisor could consult a senior advisor on specific problems, and they could also consult with the available specialist when needed.

The focus area of training should perhaps rather be the efficient facilitation of assistance than mainly disseminating agricultural technical information. Knowing what information is needed, where to find it, how to deliver it, and how to follow up on the results of it is essential. A practical example:

A smallholder farmer has a small dairy enterprise and a chicken (eggs) enterprise. She is struggling with her production and contacts his local agricultural extension officer for assistance. The extension professional cannot be expected to know everything about dairy cows and chickens. He/she must, however, be able to:

- Identify the problem. Is it due to lack of nutrients, lack of facilities, lack of resources?
- Know whom to contact to assist.
- Identify the solution. Who has to be involved, when, and where?

- Communicate the problem correctly among the various role players.
- Plan appropriately. How will this problem be solved? What is the desired outcome? When does the problem have to be solved?
- Solve the problem promptly and in such a manner that all the stakeholders are considered and have a voice.

The skills listed in the study are equally important in providing efficient agricultural extension services. The excessive focus in curricula on technical subject matter expertise results in agricultural extension professionals that are not sufficiently equipped to function in the environment they are challenged with.

Finally, as one of the participants in the focus group discussion said, the curriculum cannot be blamed for everything. The government has a plan in place, published in 2020. Urgent collaboration between government and higher education institutions is needed to ensure that undergraduate curricula are customized accordingly.

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Strengthening Agricultural Extension Training

Process Skills and Competency Gaps in Undergraduate Agricultural Extension Curriculum in South Africa

Dear Colleagues,

We are conducting an online survey under the research project *"Strengthening Agricultural Extension Training in the MSU Alliance for African Partnership Consortium Partners in Africa"* funded by Michigan State University. The core objective of this work is to identify Process Skills and Competency Gaps in Undergraduate Agricultural Extension Curriculum in Nigeria, Malawi, South Africa, Uganda and Kenya. You are invited to participate in this study because you have experience with skills and competencies required for effective extension work.

Process skills and core competencies are basic sets of knowledge, skills, abilities, and behaviors that agricultural extension professionals require to perform their tasks well and respond to contingencies, change, and the unexpected. Please keep this definition in mind while you answer the survey questions. The skills and competencies we are researching are categorized as follows in the questionnaire:

1. Program planning
2. Program implementation
3. Communication
4. Information and communication technologies
5. Program monitoring and evaluation
6. Personal and professional development
7. Diversity and gender
8. Marketing, brokering and value chain development
9. Extension soft skills
10. Nutrition skills and competencies
11. Technical subject matter expertise

The findings will be shared with all important stakeholders of agricultural extension education/ training for undergraduate curricular revitalization in Nigeria, Malawi, Kenya, Uganda, and South Africa in specific, and other African countries in general.

The Institutional Review Board approval for human subjects research for this study was obtained from Michigan State University. Please know that your participation in this study is completely voluntary and the information you provide will be treated with strict confidentiality and will only be used for research purposes. You can withdraw at any time or refuse to answer any questions.

It will take approximately 25 minutes to complete this survey. We recommend that you take this survey on a Desktop or Laptop computer. As a token of appreciation, all respondents will receive a soft copy of the research report. If you have any questions regarding the study, please do not hesitate to contact us.

Please follow this link to the Survey: Take the Survey

Or copy and paste the URL below into your internet browser:

https://msu.co1.qualtrics.com/jfe/preview/SV_eA7j51dpEPqrBau?Q_CHL=preview

Follow the link to opt out of future emails:

Click here to unsubscribe

Thank you for your time and cooperation.

Sincerely,

Research Partners from USA

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Strengthening Agricultural Extension Training

Process Skills and Competency Gaps in Undergraduate Agricultural Extension Curriculum in South Africa

1. Primarily which country's extension system do you represent? (Check one)
   - Nigeria
   - Malawi
   - Uganda
   - South Africa
   - Kenya
   - Others (Please specify the other country not listed above) _____)
2. Which university (ies) do you have deep knowledge of undergraduate education in agriculture or allied subjects? (Please write the university name(s)_____)
3. What is your current position? (Check one)
   - Extension Staff in a University
   - Extension Researcher
   - Public Sector Extension Professional
   - Private Sector Extension Professional
   - NGO Extension Professional
   - Employer of Agriculture Graduates
   - Any other (Please specify) ----------
4. Are you familiar with current undergraduate level agricultural extension curriculum in the country or institution in questions 1 and 2?
   - Familiar
   - Not familiar

Instructions: Questions A through K have two components: first you will rate the importance of each competency, and the second, you rate how well the undergraduate extension curriculum covers this competency. Please rate the importance and the level of competency on each statement on a 1 to 5 scale as explained below.

How important is this skill or competency for an extension worker?	Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?
1. Not Important 2. Somewhat Important 3. Moderately important 4. Important 5. Very Important Please check a box (✓) for each statement that best represents your opinion.	1. Not at All Covered 2. Minimally Covered 3. Moderately Covered 4. Well Covered 5. Very Well Covered Please check a box (✓) for each statement that best represents your opinion.

A. Program Planning Skills and Competencies:

	Job skills and competencies: Extension professionals should be:	A01 How important is this skill or competency for an extension worker?					A02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Familiar with the vision, mission and goals of National /State (sub-national) extension service and agricultural development strategies, programs, and policies.										
2	Able to conduct needs assessment and engage stakeholders to prioritize local needs.										
3	Able to conduct baseline or benchmark studies.										
4	Able to mobilize resources / funds to address priority needs.										
5	Able to engage local stakeholders (e.g. NGOs, cooperatives, local agro-dealers) in extension program planning.										

Job skills and competencies: Extension professionals should be:		A01					A02				
		How important is this skill or competency for an extension worker?					Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
6	Familiar with administrative and financial rules of their respective organizations (to utilize human and financial resources in extension programs).										

B. Program Implementation Skills and Competencies:

Job skills and competencies: Extension professionals should:		B01					B02				
		How important is this skill or competency for an extension worker?					Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Coordinate local extension programs and activities.										
2	Demonstrate teamwork skills to achieve extension results.										
3	Able to form farmers groups and support them.										
4	Engage local stakeholders (e.g., NGOs, Self Help Groups, Cooperatives) in implementing extension programs.										
5	Demonstrate negotiation skills to reach consensus and resolve conflicts.										

Job skills and competencies: Extension professionals should:		B01 How important is this skill or competency for an extension worker?					B02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
6	Follow participatory decision-making in extension work.										
7	Delegate responsibilities to staff as needed.										
8	Be able to engage minority groups (e.g. Female farmers and youth development groups) in extension work.										
9	Integrate private or public-private partnerships in extension service provision.										

C. Communication Skills and Competencies:

Job skills and competencies: Extension professionals should be able to:		C01 How important is this skill or competency for an extension worker?					C02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Select appropriate communication methods.										
2	Establish communication with different stakeholders.										
3	Respect local culture while communicating with clients.										
4	Prepare required progress reports.										

	Job skills and competencies: Extension professionals should be able to:	C01 How important is this skill or competency for an extension worker?					C02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
5	Share success stories and lessons-learned with stakeholders through various media.										
6	Use extension methods (e.g., individual, group and mass contact methods) to disseminate information about extension activities and programs.										
7	Demonstrate good listening skills and listen to all clients and stakeholders.										
8	Demonstrate good public speaking and presentation skills.										

D. Information and Communication Technologies (ICTs) Skills and Competencies:

	Job skills and competencies: Extension professionals should be able to use:	D01 How important is this skill or competency for an extension worker?					D02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Microsoft Word for word processing (e.g., typing, editing, printing) and designing graphics.										
2	Data entry and analysis software such as Excel, SPSS etc.										

3	Microsoft Power Point for making presentations.										
4	Audio-visual aids such as charts, graphs, and puppet show for teaching and learning.										
5	Mass media like FM radio stations and television channels for communication.										
6	Computers (email, Internet) for communication.										
7	Mobile phone services (e.g., texting, SMS service) for communication.										
8	Social media (WhatsApp, Facebook, Twitter, Instagram, etc.) for communication.										
9	ICT tools to improve access to information, knowledge, technologies and other innovations.										
10	ICT tools to enhance collaboration and partnerships.										
11	ICT tools for collecting data, monitoring, and evaluation of extension programs.										

E. Program Monitoring and Evaluation Skills and Competencies:

Job skills and competencies: Extension professionals:		E01 How important is this skill or competency for an extension worker?					E02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Understand theories and principles of monitoring and evaluation.										

	Job skills and competencies: Extension professionals:	E01 How important is this skill or competency for an extension worker?					E02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
2	Conduct monitoring and evaluation of extension programs.										
3	Develop data collection instruments - interview schedules / questionnaires- for monitoring and evaluation of extension programs.										
4	Conduct online surveys for monitoring and evaluation of extension programs.										
5	Apply qualitative tools and techniques (e.g., focus group discussion, case study etc.) to collect evaluation data.										
6	Apply quantitative tools and techniques (e.g., survey, interview, farm data, etc.) to collect evaluation data.										
7	Analyze data (qualitative and quantitative).										
8	Interpret data (qualitative and quantitative).										
9	Write evaluation report.										
10	Share evaluation reports within their organizations and with stakeholders.										

Job skills and competencies: Extension professionals:		E01 How important is this skill or competency for an extension worker?					E02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
11	Apply the evaluation findings in replicating/scaling-up of extension programs.										

F. Personal and Professional Development Skills and Competencies:

Job skills and competencies: Extension professionals should:		F01 How important is this skill or competency for an extension worker?					F02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Apply principles of good governance (i.e., clients participation, accountability and transparency) in extension work.										
2	Show commitment to career advancement (participate in lifelong learning, in-service training, professional development events and conferences).										
3	Apply professional ethics in extension work i.e., promote research-based recommendation or technology.										
4	Follow organizational policies and directives for professional development.										
5	Demonstrate honesty and positive attitude towards extension work.										

G. Diversity and Gender Skills and Competencies:

Job skills and competencies: Extension professionals should:		G01 How important is this skill or competency for an extension worker?					G02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Understand that diversity exists within and among clients and stakeholders.										
2	Identify the needs of small-scale farmers.										
2	Identify the needs of minority groups.										
3	Develop extension programs to benefit women farmers.										
4	Develop extension programs to benefit youth.										
5	Engage marginalized and vulnerable groups in extension programs (e.g. disabled, resource poor farmers).										
6	Do teamwork with diverse staffs.										

H. Marketing, Brokering and Value Chain Development Skills and Competencies

Job skills and competencies: Extension professionals should:		H01 How important is this skill or competency for an extension worker?					H02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Have basic knowledge of agri-business development.										
2	Apply brokering / advisory skills in agri-business development.										

Job skills and competencies: Extension professionals should:		H01 How important is this skill or competency for an extension worker?					H02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
3	Have knowledge on different agricultural markets and linkages.										
4	Demonstrate knowledge of value chain logistics and input-output linkages in the value chain.										
5	Facilitate entrepreneurship development among extension clientele.										
6	Be able to link farmers producers' organizations / cooperatives / agri-business companies with extension.										

I. Extension Soft Skills and Competencies

Job skills and competencies: Extension professionals possess the other soft skills like:		I01 How important is this skill or competency for an extension worker?					I02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Critical thinking										
2	Problem solving										
3	Time management										
4	Stress management										
5	Leadership										
6	Teamwork										
7	Flexibility										
8	Self-motivation										

Job skills and competencies: Extension professionals possess the other soft skills like:		I01 How important is this skill or competency for an extension worker?					I02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
9	Interpersonal skills										
10	Positive work attitude										
11	Collaboration										
12	Conflict management										
13	Group formation and development										
14	Negotiation skills										
15	Networking skills										
16	Facilitation skills										
17	Creativity /Innovativeness										

J. Nutrition Skills and Competencies

Job skills and competencies: Extension professionals should:		J01 How important is this skill or competency for an extension worker?					J02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Demonstrate basic human nutrition knowledge (e.g., food composition, balanced diet, supplements, nutritional composition of various foods, nutrition deficiency symptoms etc).										
2	Understand lifecycle nutrition needs of different household members (e.g ., children of various age groups, pregnant and breastfeeding mothers, elderly).										

Job skills and competencies: Extension professionals should:		J01 How important is this skill or competency for an extension worker?					J02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
3	Able to advise families on what crops and livestock to be produced to ensure balanced diets.										
4	Advise families to improve gender relations for increased agriculture production and nutrition.										
5	Demonstrate postharvest handling technologies that conserve nutrients and food safety (e.g. food storage, freezing fruits and vegetables, making pickles, jams, jellies).										
6	Have basic knowledge about food labeling (e.g., organic foods).										
7	Able to advise on healthy diet (e.g., for fitness and sports, diabetes, cancer and AIDS/HIV, heart health, kidney disease, osteoporosis; weight loss and obesity).										

K. Technical Subject Matter Expertise/Skills and Competencies

Job skills and competencies: Extension professionals should:		J01 How important is this skill or competency for an extension worker?					J02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
1	Demonstrate technical knowledge in their basic discipline (e.g., field crops / livestock/ fishery/ horticulture etc).										

Job skills and competencies: Extension professionals should:		J01 How important is this skill or competency for an extension worker?					J02 Based on Your Answer in Question 2, How Well Does the Undergraduate Extension Curriculum Cover this Competency?				
		1	2	3	4	5	1	2	3	4	5
2	Understand adult learning principles and hold practical skills required to teach improved farming practices.										
3	Understand the new technology being promoted, i.e., what it is, why, and how it works.										
4	Facilitate farmers to access inputs and services (e.g., credit, seed, fertilizers, feed, artificial insemination, etc.)										
5	Be able to educate community members about different types of risks and uncertainties (e.g., due to market fluctuations, natural disasters, etc.).										
6	Be able to educate community members about climate change and climate smart agriculture.										
7	Refer to and make use of publications--journals, research reports, etc.										
8	Generating knowledge or producing research reports / journal publications.										
9	Able to harness, document, validate and integrate local / indigenous knowledge.										
10	Understand social system under which farming takes place (e.g., rural sociology knowledge).										

L. Additional Information about Competencies: If you feel there are additional job skills and competencies that extension professionals need, but are not listed above, please write them in the spaces below:

1.

2.

3.

4.

M. How can we make agricultural extension curriculum robust and practical? Please rate the following strategies:

Strategies for Improvement	Already exists	Good to have	Important	Essential
Provide practical and contemporary skills (e.g., through mentored internship or attachment to a progressive farmer in a crop season).				
Include various soft skills in extension curriculum.				
Include business management concepts and practices in extension curriculum.				
Expose students to market opportunities, linking farmers with service providers, and develop entrepreneurship.				
Grooming students with broad-based general agricultural courses (e.g., crop and animal production, postharvest, marketing, and joint ventures) along with extension training.				
Incorporate youth development, gender issues, urban/sub-urban agriculture, and climate change concepts in extension curriculum.				
Recruit extension faculty carefully.				
Include research and data analytical skills.				
Offer training of trainer workshops for extension faculty members.				
Develop cutting-edge and practical teaching learning resources – extension textbooks, practical handbooks, training manual, etc.				
Undergraduate extension curriculum/pedagogy should be more ICT oriented				

N. What are the appropriate ways to acquire the above-mentioned core competencies? Please rate each way or mechanism on a scale given below:

Ways to acquire core competencies:	Not appropriate	Somewhat appropriate	Appropriate	Very appropriate
Through **Preservice Training** by revising or updating the curriculum.				
Requiring **Internship** at various work environments (i.e., Public Institutions, NGOs, Private Companies, etc.) during UG, PG, or PhD programs.				
Through **Basic Induction Training** (e.g., job orientation training at the beginning of job)				
Through **In-service Training** (e.g., training offered during the employment at Universities, Training Institutes/Centers, etc.)				
Providing opportunities to attend **trainings,** seminars, workshops, webinars, etc.				

O. If you feel there are additional appropriate ways to acquire process skills or competencies but are not listed above, please write them in the space below.

P. What are the major barriers to effective implementation of extension training curriculum in your country? Please check all that apply.

- Development of an effective extension curriculum
- Quality faculty to teach extension courses
- Quality textbooks and/or manuals
- Classroom and demonstration farms or facilities
- Accreditation
- Time constraint
- Budget to support practical learning experience (e.g. filed visits and demonstrations)

- Student motivation to study extension and in practical extension work
- Teacher motivation to teach requited process skills and competencies
- Other (please specify) _____

Q. What is your age now (in years)? _____

R. What is your gender?

____ Woman

____ Man

S. What is your highest level of education? Select (P) one that applies.

____Bachelor's degree

____Master's degree

____Doctoral (Ph.D.) degree

____Other (please specify_____)

T. How long have you served in extension profession extension or agriculture related fields? (Write total number of years you have worked in extension). _____

U. If you would like to receive a copy of the research report, please provide your e-mail:

Thank you for taking the time to complete this survey!

Strengthening Agricultural Extension Training

Process Skills and Competency Gaps in Undergraduate Agricultural Extension Curriculum in South Africa

FGD Invitation Letter

Date: ----------

To

Dear Sir / Madam,

Greetings.

We are conducting a research project **"Strengthening Agricultural Extension Training in the MSU Alliance for African Partnership Consortium Partners in Africa"** funded by Michigan State University. The core objective of this work is to identify Process Skills and Competency Gaps in Undergraduate Agricultural Extension Curriculum in Africa.

As part of this research work, we are conducting a Focus Group Discussion on **'Process Skills and Competency Gaps in Undergraduate Extension Curriculum'**, with extension faculty, researchers, practitioners and employers in both public and private organizations as well as extension postgraduate students.

Venue: ----------

Date & Time: ----------

The Focus Group Discussion will be followed by a Lunch.

May I request you to kindly participate in the Focus Group Discussion and share your viewpoints on **"Process Skills and Competency Gaps in Undergraduate Extension Curriculum."**

Please confirm your participation by ---------- (date) by calling me at: ---------- (Phone Number) or via e-mail at: ----------

Thank you for your time and cooperation.

Yours Sincerely,

(Name & Designation of Researcher)

Strengthening Agricultural Extension Training

Process Skills and Competency Gaps in Undergraduate Agricultural Extension Curriculum in South Africa

Good morning / afternoon ladies and gentlemen and welcome to the FGD. My name is ---------- (Name & Designation). Assisting me is ---------- (Name & Designation). We have asked you to join us today so that we can listen to you, our colleagues and friends of agricultural extension services. More specifically, we are interested in your thoughts and opinions regarding agricultural extension and how extension services could address the evolving needs of our graduates, farmers, agribusinesses and development partners.

The objectives of this Focus Group are to gather information, including perceptions and ideas, from you about:

a. How effective our extension programmes are in addressing the needs of our food and agricultural systems?

b. What are the critical skills and core competencies required of extension workers to effectively plan, implement and evaluate extension work in the changing context?

c. Does our undergraduate curriculum in extension education include education and /or training on these job skills or core competencies necessary for successful extension service delivery?

d. What are the major barriers to effectively train extension workers with the required core competencies and how can these barriers be removed?

Your responses will be used to supplement the results of a broader, nation-wide, and continental survey. The results of the FGD and the online survey will be used to recommend subsequent development of competency–based curriculum for extension professionals across Africa. Therefore, it is very important that you respond as openly and thoughtfully as you can. There is no right or wrong answers in our discussion today. Many people have different experiences in extension activities, so feel free to comment even if your thoughts, ideas, and experiences are different from what others have to say. My job is to guide the conversation and keep us on time to be sure we finish in the allotted time, so along the way I may interrupt, or I may push us along a little bit faster, so that we can finish our conversation on time.

This session is audio-taped to ensure accuracy in our written summaries. However, we will do everything in our ability to ensure the confidentiality of your responses; no transcribed comments will be attributed to any individual. To make sure we capture all the comments, we ask that you speak one at a time. Indeed, focus groups are mostly successful when participants share the time among themselves, but don't feel like you have to respond to every question.

If any question is ambiguous or confusing in any way, please ask for clarifications.

The session may last about 90 minutes and we will not take a formal break, so if at any time, you wish to get up for coffee or a snack, please feel free to do so.

Do you have any question before we begin?

Let us begin by finding out a little more about each other. As we go around the room, please introduce yourselves and tell us a bit about your involvement in extension and agriculture related business or industry.

1. What are you hearing among your fellow extension professionals and/or from people in the agricultural community about agricultural extension in ----- (Country name)?
2. What has been your own experience with respect to agricultural extension? Are you involved in developing extension curriculum, teaching extension courses, hiring extension workers, supervising extension workers or developing extension programs or policies? Please share your experience.
3. How effective are our extension programs in addressing the needs of the changing agricultural systems? What are one/two things that extension service is doing particularly well in your university, state or region in agriculture arena?

   [Pass around a blank white paper page and pencil. Ask them to list one or two things that extension is doing well.]
4. If you could come up with three major recommendations to improve agricultural extension services and program delivery, what would they be?

   [Pass around a blank paper and pencil. Ask them to list three things to improve the extension services.]
5. What are three critical job skills or core competencies required of agricultural extension workers in the changing agricultural and rural development context?

   [Pass around a blank paper and pencil. Ask them to list three process skills or competencies required of extension workers for effective extension work.]
6. Does our undergraduate extension curriculum effectively train students on the above job skills core competencies?
7. If not, what are the gaps that need to be filled in terms of the current curriculum in existence?
8. Again, what are the main barriers to effectively train undergraduate students with the required core competencies and how can these barriers be removed?

   [Pass around a blank paper and pencil. Ask them to list the main barriers and how these barriers can be removed.]
9. What changes or modifications might you recommend with respect to agricultural extension curriculum? Are there courses we are not teaching that we should consider including extension curriculum? What courses or contents are outdated that we should

consider dropping out?

10. Finally, we have invited you here because we value your inputs and responses to our questions, but we would like to know who else we should be asking. Do you have suggestions for others we should be including as we continue to seek inputs and advice on how to improve our curriculum? Who are they? What should we be asking them?

11. Are there any final comments?

Our time has passed so quickly. On behalf of Research Team on this Project, I want to thank you for taking time from your tight schedules to share with us this important information. Your comments and suggestions will help us develop recommendations for **"Strengthening Agricultural Extension Training at the Undergraduate Level in Africa."**

If you would like to receive a copy of the research report, please provide your e-mail:

[Pass around a blank paper and pencil to write the e-mails.]

Thank you for your participation!

About This Document

This AAP-PIRA research project assessed the process skills and competency gaps in undergraduate (UG) agricultural extension curriculum in South Africa with specific research questions: (a) Do extension programs effectively address the needs of current food and agricultural systems? (b) What are the critical job skills and core competencies required of extension workers to effectively plan, implement, and evaluate extension work in today's changing context? (c) Does the undergraduate curriculum in extension education include education and/or training on these job skills or core competencies? and (d) What are the barriers to effectively training extension workers with required core competencies, and how can these barriers be removed? Overall, the findings revealed a significant gap between existing level of importance and level of coverage of core competencies in the UG courses. In order to keep UG agricultural extension curricula relevant, updated and consistent among different universities, the authors identify and recommend 11 process skills and core competencies with 97 subcompetencies for their inclusion in the National Qualifications Framework to enhance the efficiency of agricultural extension and advisory services in South Africa.

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